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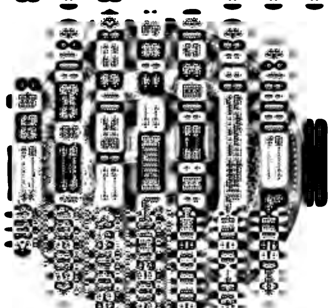

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THE

AMERICAN JOURNAL

OF

DENTAL SCIENCE.

Vol. III. THIRD SERIES--MAY, 1869. No. 1.

ARTICLE I.

Review of a Lecture upon Clastic Anatomical Models,

Delivered before the Baltimore College of Dental Surgery, by F. G. Lemercier, Co-operator of Dr. Auzoux and Professor of the Polytechnic Association of Paris.

While delivering a course of lectures before Peabody Institute of Baltimore, Dr. Lemercier was engaged by the Faculty of the Baltimore College of Dental Surgery, to deliver a lecture upon "Clastic Models," and to exhibit before the class the specimens he had brought from Paris.

This Lecture was delivered March 2nd 1869, and before a large and appreciative audience, embracing the class, many physicians and dentists of the city, and the Faculty of the College.

The subject was one of the deepest interest, to the Faculty and to the class, as offering the only solution of "that vexed question," "*anatomical study by dissection.*" That a student can find time, in two or even three courses, to perfect himself in practical anatomy by dissection, is simply an utter impossibility; and to meet and obviate this great *error* in our schools has been the aim of the Faculty for some years. Anatomical study requires either the subject, or a series of finished models, the first being impracticable, the latter must be adopted from necessity. It is worse than

useless to discuss the value of dissection, we all admit its value, if thorough; and yet two-thirds of the medical graduates ever, are most lamentably deficient in their anatomy. Turn it over as we may, shirk it as we please, yet the patent fact stares us in the face, that dissection, as a means of acquiring a practical knowledge of anatomy, is as at present conducted in our schools, both medical and dental, an unmitigated humbug.

It is practically a grand failure in America.

Drs. Lemercier and Auzoux have met this great question fairly and squarely—they have prepared one of the most comprehensive series of models ever offered the profession.

The human body as a whole; then resolved into systems of organs—then into special organs; then into tissues; and finally into the minutest *naked eye* anatomical forms. Then by comparative anatomy, from the simplest rudimentary form of organ and rudimentary function, up to the most elaborately complex anatomical structure and gradual differentiation and development of the highest physiological office. There is nothing wanting even in the comparative anatomy, for the illustrating models of each organ show its earliest and simplest, as well as its final and most complex anatomy.

These models have an anatomical accuracy which commands the highest admiration, and in many instances the greatly magnified proportions give the microscopical anatomy, to the unassisted eye, with a truthfulness which leaves us mute.

"From the first appearance of the ovule in the ovary to the formation of the embryo, and about to the 30th day of pregnancy," there are more than 20 magnified models, illustrating the process in a way no dissection could possibly do. These models of the Fœtus and Uterus during each month of gestation; models illustrating the infant's 1st year and then up to adult life; and in each and every model where ever organs are distinctly marked, they are arranged "clastically," *i.e.* so arranged, that they can be removed one by one from

the body, and each organ studied by itself. Not only is this true, but each organ, if of any size, is always in many pieces, showing its exact anatomical structure.

The human being from ovule to adult life, is illustrated; the system of organs and the special organs are also illustrated; and by the models from comparative anatomy the tissues and organs are traced up to their complete perfection in man; enabling us in a few months to grasp, comprehend and retain those grand truths of comparative developement, the evolution which cost Cuvier, Owens, Cruvielhier, &c., so many years of unremitting labor. To such a degree has this process of copying nature by elastic models been carried, that vegetables, fruits and flowers have all been laid under contribution and made to contribute their quota. The study of Botany is thus rendered both interesting and instructive, to those who never have seen the flowers of the country, and who depend alone upon the models for their information.

Being fully cognizant of the above facts, and appreciating the perfect failure of dissection, as at present conducted in the different schools of America, the Faculty of the Baltimore College of Dental Surgery had procured specimens and models, and among the number was "a life size elastic preparation of man" from the firm of Auzoux and Lemercier, of Paris.

This model had been used in the anatomical and physiological lectures of the session, and had given the most complete satisfaction to both students and professors, and it was with the most lively interest, and an earnest appreciation of the subject, that the class and faculty listened to the lecture.

The lecture was a description of the models, many of which were exhibited as specimens, and their anatomical relations accurately described.

Dr. Lemercier exhibited several greatly magnified specimens;—one of the hand, another of the eye, another of the ear, were probably the best and most striking.

He took up this enlarged model of the hand, and dissected

it piece by piece, giving with perfect accuracy the anatomy down to the veriest minutiæ of fascia and ligament; he removed the *skin from the thumb*; showed the matrix and bed of the nail in the most beautifully correct and scientific manner. He then continued his dissection, demonstrating as he proceeded, just as the ordinary demonstrations of Anatomy are given; step by step he removed fascia, tendons, superficial muscles, arteries, veins, nerves, &c.; then the deeper muscles of thenar and hypo-thenar eminences; deeper arteries, veins, nerves, tendons; finally the interossei muscles and their attachments and the joints with their respective ligaments. Every portion was removed and the plainest skeleton of the hand alone remained; this was the anatomical analysis of the hand, then the separate constituents were one by one replaced and the hand by this synthetic action perfectly restored to its first appearance. We doubt extremely, whether one month's unbroken dissection of the hand could convey as clear an idea of its anatomy, as did that 15 minutes of analytic and synthetic study by the model.

The "Magnified Eye" was next taken up, and the severest critic could have found little indeed for censure or criticism, as he watched the incomparable manner in which the lecturer dissected and demonstrated this most complex organ. The sclerotic coat was removed first; then choroid and cornea; next the *iris* and ciliary ligament with the aqueous humor; then the crystalline lens and vitreous, with "central artery."

The retina was now brought fully into view and its anatomical structure in all its microscopical complexity carefully stated; the optic nerve, optic disc, yellow spot of Soemmering, and the radiating fibres of the optic nerve were all carefully shown.

The lecturer then gave an admirable account of the "optical mechanism of the eye" and "the optical action" of this mechanism, then of the nerve mechanism and its action; and finally explained all the movements of the eye ball by

the recti and oblique muscles. He showed the distribution of the third pair of nerves to the superior, inferior and internal recti, and to the "levator palpebrae" and inferior oblique muscles; he showed the distribution of the fourth pair to the superior oblique and sixth pair to the external rectus. The distribution of the opthalmic division of the fifth pair was also beautifully exemplified.

The "Magnified Ear" was next exhibited and as thoroughly dissected, and minutely described as had been the eye; the external ear—auditory canal—"membrana tympani;" and tympanum with the chain of little bones, *malleus*, *incus* and *stapes*; and the stapadius, tensor and laxator tympani muscles; the fenestra ovalis and fenestra rotunda, Eustachian tube and mastoid cells were fully shown; the internal ear or labryrinth with its vestibule, semicircular canals and cochlea was shown, and minute descriptions given of canals and cochlea.

The anatomical details were perfect, and the portions demonstrated were one by one removed, examined, function given and then replaced.

At this stage of the lecture, all present felt the great value of these magnified models, for the internal ear is not a thing that one student in five-hundred ever dissects or ever understands, and yet there before the audience was every part laid that could belong to the normal ear;—and piece by piece they had witnessed the dissection without one drop of blood obscuring the clearness of the anatomical forms until the ear as a whole had been resolved into its constituent elements.

It is impossible in our short review, to notice all of the models exhibited, and we therefore pass to the last and most exquisite of them all.

"The models showing the nervous system from Comparative Anatomy."

To the comparative anatomists and to the comparative physiologists, this was indeed a treat rarely enjoyed, in this country. The models began with the Class *Radiata*, of which the star-fish is the type; where we have series of gang-

lia arranged in a more or less circular form and connected with each other by nervous cords. Then the Hetero-gangliate type, " with its ganglia and nerves around the gullet and nerves radiating symetrically to be connected with other irregular scattered ganglia;" the oyster and snails are examples:

Then the articulata-homogangliate type, " having a double ventral cord, with ganglia at short intervals,, generally a pair (right and left) coalesced on the middle line for *each* segment of the body, and communicating anteriorly by nerves surrounding the gullet, with a pair of supra œsophageal ganglia. To this class belong "earth" worms, insects &c. Finally the vertebrate class was represented, and models showing the comparative anatomy of the ganglia of special sense exhibited.

The Sensory ganglia exhibited in the order of normal developement, from Fish, Reptiles, Birds, Mammals, and up to the highest grades in the mammals. Then the cerebral ganglia were given by the same order, and the size and complexity of the convolutions were shown to coincide with the intelligence of the animal. The size of the brain and complexity of convolutions were illustrated by several models, beginning with some of the lowest species of the Monkey, and running up to the adult brain of the Caucasian. The brain of an idiot was shown, and its small size contrasted with the normal adult brain; the arrested anatomy causing arrested physiology; for with arrest of the developement of the Cerebral Ganglia, or superficies of the brain, there was a paripassu arrest of intelligence.

The Ganglia of the lowest and of the highest grades of animal life ever compared and contrasted, the functions being ascertained to a great extent by watching the anatomical mechanism and seeing its increase in size correspond with increased power of some special sense; or with increased accuracy and intensity of the manifestation of some special function belonging to the nervous system. From this comparative anatomy and from the comparative physiology of the

nervous system, we are enabled to evolve certain grand truths in regard to nervous action and nervous phenomena.

1st. It teaches us that the nervous system is but a series of ganglia, connected and commissured by white cords called nerves; 2nd. That the internal and external peripheries are connected or commissured with these ganglia by similar cords or nerves.

3rd. That these cords or nerves are for conduction only,(even as the wires of the telegraph) and they conduct in distinct lines, isolated and with extreme velocity. 4th. That there are two kinds of nerves—or nerves discharging two distinct functions even in conduction:—the one called *afferent* or *Sensory*, begins in a sentient recipient expansion on the periphery internal and external, and terminates in the *nervous* ganglia or "nerve centres"; the other, *efferent* or *Motor*, begins in these same nerve centres and *returns* to the same pheriphery, and is then lost by blending in organic continuity with the tissues; it is therefore impossible to tell in every instance, where nerve tissue begins or where it ends, for in some instances it runs into and blends so imperceptibly, with other tissues that there is no line of demarcation. Afferent nerves begin in peripheral expansions and end in ganglionic masses—or nerve centres; efferent nerves begin in the ganglionic masses or nerves centres and end or terminate in peripheral expansions, or peripheral distribution; the function is the same, i e. conduction, only one conducts *to* and the other *from* nerve centres.

Function of Nerve Centres.

Of course they *receive* impressions from the afferent;—of course they transmit or send out impressions by the efferent nerves; but they also diffuse—concentrate—store up or retain; they diffuse, for one nerve often enters a ganglion, and many nerves may leave this ganglion,hence any impressions brought in by the one is reflected and diffused through many *efferent* channels; they concentrate, for often several nerves enter but only one emerges from a ganglion, hence in this case the *many* impressions by the afferent are con-

centrated and sent out by *one efferent* nerve; they retain or store up—for often the impressions brought to the nerve centre are not all reflected, but a portion is stored up or retained and after some marked interval is allowed to escape—or may even be retained for an indefinite period—in this case the ganglion is said to "*register*" the impression.

Ganglia therefore have several different modifications of nervous action; they receive impressions;—transmit and reflect impressions;—diffuse and concentrate impressions;—retain or store up impressions; now a careful consideration of the above, will at once prove, that ganglia are capable of altering, modifying, combining and even taking off and registering, thus *for the time, destroying impressions.*

Now there is another function of the ganglia, or at least another power which the ganglia exhibits when acted upon by its appropriate agent; it is the power of "elaboration." The power of collecting registered impressions and combining and interweaving them, so as to produce new combinations—new results. For this process to take place three elements are necessary:—1st afferent nerves to receive and conduct impressions; 2nd ganglia to receive and register these impressions; 3rd an agent to act upon the ganglia—to resurect as it were these registered impressions and to combine and elaborate them.

"The nerves of special sense and afferent nerves generally, collect impressions;—the intra-cranial ganglia register these impression;—the *soul* acting upon the brain is the agent which elaborates them in the process of "mental action," vide Draper's Human Pysiology, page 285 &c.

Now having determined the functions of nerves and of nerve centres, we will return to Dr. Lemercier and his models.

The models of the class Articulata, show a double ventral cord;—or a cord consisting of ganglia commissured on the same horizontal line, each with its neighbor in front and its neighbor behind; then each ganglia was connected by another short commissure with a *band of nerves*, or nervous matter of fibrous form, immediately above it; so each ganglia

had two horizontal and one vertical commissure excepting the first and last, these of course had only one horizontal commissure each; now each ganglia could be shown to consist of two ganglia, placed side by side and coalescing on the median line; the ganglia discharge the usual functions of ganglia and the cord or band above the ganglia, is a band of nerves. commissuring these ganglia with another series of ganglia, situated not beneath the belly but above it, and above the œsophagus and called "supra œsophageal ganglia." These supra œsophageal ganglia a sort of bilobed mass, correspond in function with the brain of the higher classes.

This bilobed mass is the seat of the instinct, and the band of nerves subventral, connects the subventral ganglia with this bilobed mass, i.e. it is a commissure. Tracing by comparative anatomy, the gradual development of this subventral cord and the subventral longitudinal series of ganglia, we are enabled to mark the blending of the two until we reach the vertebrate type, and here the *position* is also changed; for the cord is no longer subventral but dorsal, and enclosed in a jointed bony canal—in this class it is called the "spinal cord."

Now this "spinal cord" presents the appearance of a mass of whitish nerves or cords, and only when we cut into its symmetrical halves right and left do we find the greyish ganglionic substance and find it commissured on the median line.

Ganglia so distinct in the articulata, have been completely surrounded, enveloped hidden from view by the commissural band; and not only is this true, but these ganglia have been so crowded together, that they communicate right and left, and run into each other above and below, thus there is a loss of anatomical individuality in the ganglia, and a blending in organic continuity of a continuous extension of ganglionic substance. The white commissural band envelopes this extension of ganglionic matter and we have the "spinal cord."

The functions of this cord are: 1st, physico-reflex in virtue of its coalesced and blended ganglia, 2d commissural in virtue

of its band of white nerves and of some grey cords also, the analogy between articulata and the vertebrata hold good in the physiology as well as the anatomy.

To be Continued.

ARTICLE. II.

Microscopy of the Dental Tissues. New Series.

By S. P. Cutler, M.D.,A.E.G.,D.D.S,

Continued.

Histology and Physiology—It will be seen by formulas given in the previous article, that fats and oils are the most important calorifacients found in the organism except free phosphorous and sulphur. Let us examine into Creative wisdom in the distribution of these elements. Fat is found in healthy animals just under the skin over the whole body, in thick sheets as the omentum covering the abdominal vis ciru, studding the mesentery, covering portions of the heart and kidneys, and filling the hollows of long bones except in birds whose bones are filled with warm air and very light. It is always found where most needed as heat generator and non-conductor, also to fill places unoccupied by other tissues, and serves mechanical purposes as well as vital. The cavities of the chest and cranium are not protected to the same extent as the abdomen by fat, as it is not necessary they should, notwithstanding these cavities contain the three vital organs. These cavities are enclosed by bony non-conducting walls, one being the hemal and the other neural, the hemal being the principal aerating surface, the mural being the centre of sensation, inteligence and volition. The latter in consequence is more highly endowed with the more energetic oxygen consumer phosphorus, superceding the necessity of the more cumbrous agent fat, and here space is important. We may then suppose that the greatest amount of heat generating material is deposited where most needed, and this same supposition may equally apply to all other elements existing in the organism. Climatic influence in

relation to dermal and sebaceous endowments is very great. Animals in cold climates require thicker and heavier fur and hair, and a greater amount of fat, as well as more food of combustion to resist the radiating influence of cold from the lungs and skin. Birds are more exposed to such influences, have a higher temperature and require more fat and dermal raiment as feathers, and more food, and starve to death sooner than mammals. Cold blooded animals as Reptiles and cold blooded Fishes have but little surplus fat. The warm blooded Cetaceans breath air and have large deposits of fat on the surface and require more food. A snake can live six months on one frog, as their nutrition and waste is exceedingly slow, as their bodies do not resist external changes of temperature to any great extent. Animals that attain a definite size in a given time have a definite limit of existence, and if not removed by disease or accident perish by natural limitation. As these limits can never be extended or transcended they may be regarded as definite and determinate, they may, by indiscretion, abuse and violation of hygienic and physiological laws, shorten the limitation allotted to each individual existance, when by proper observance of these laws the ultimate limits may be reached, which may vary in each individuality. In childhood and youth the elements are oxidizable, owing to excess of oxidizable elements and a corresponding activity of oxidation, nutrition and growth, all the tissues are more oily and less dense than in more advanced years.

Cell contents are more oxidizabl than cell structures, there being scarcely any vital resistance offered in the former case to the action of oxygen. Oxidation here is not meant putrefaction which does not take place in the living body in living tissues, such however being the case after death in a part or whole—hence oxidation taking place in a living body is different from that which takes place after vital resistance ceases. In fasting in fevers and old age, there is less of nutrition in fevers, there is increased oxidation in fasting, and in old age there is diminished nutrition and oxidation both,and

less capability of resisting the influence of external changes —not so in fevers. In all the above cited cases the first to suffer oxidation is cell contents throughout the entire organism, though in different degrees in different structures.

In all the above cases there is diminished energy in the symptoms, owing to loss of normal vitality, though brought about somewhat differently. As old age advances, the cells and contents become less oxidizible. the tissues becoming more dead, less vital resistance, less energy, the chemical forces proper gradually gain on the vital until they are completely subordinated and death ensues. The body even then is capable of being trans-substantiated into other living organisms. As old age advances the same bulk and weight may be retained as in middle life, still, histology teaches us that there have been losses in certain elements and immediate principles, the change being in favor of the inorganic disconnected from the organic kingdom by a loss of balance in the forces of oxidation and nutrition, or decay and reproduction. In the burning of starch, sugar, and oils the presence of azotised compounds may play a catalytic part by converting oxygen into ozone, consequently fermentation of the tirnary groups; there is however no fermentive action, formation of alcohol and carbonic and other acids, and farther on acetic acid instead, only carbonic acid and water being formed, no splitting up into one inorganic and another equivalent of organic division as in ordinary fermentations of the tirnary group—outside of the animal organism the process is different. The vital properties of muscles consist exclusively in contractility by shortening and widening, not by any indwelling power inherent in the muscular fibres themselves, not an instrinsic but an extrinsic power or force sent to them from points outside, not by any demand being made by the muscles themselves, they being wholly passive and unconcious until suddenly roused by this outside stimuli or vis-a-tergo being forced in by motor nerves. The muscles in themselves are similar to the bones, only passive agents obedient to some other outside influence. Respiration, cir-

culation and voluntary motion are but muscular motion that motion being an effect secondary to something else called vital force and dwells in the brain and nervous system, this in turn is secondary being but a reserve force received from all points in the organism wherever oxidation takes place. The power and duration of muscular contraction depends on due development of muscular and neural systems and hygienic conditions. Each cell forms its own equivalent of vital force and sends it up to general headquarters on one set of nerves, and is returnd by another set of nerves, the sensorial and motors. The brain is a charged prime conductor, while the passive muscle is the negative conductor, so to speak, and when the charge is turned loose by volition it is by the same act directed to a certain muscle or muscles, causing them to contract, they in turn then become positive to the brain which becomes negative, until another act of volition turns off the charge from the muscle causing it to relax, then the ord r is again reversed. There are certain tissues that possess very low vital properties simply chemica-vegetative, and only perform passive functions in the organism, as bones, ligaments, tendons, fascias, and others still are no less important in making up the "*tout ensemble*" of life. The blood though a moving tissue possesses vital properties of the highest order, is propelled by intrinsic andextrinsic force, both the intrinsic may be supposed to be polar force, dependent on polarity of the corpuscles among themselve and polar relations, between the moving mass and the tissues, the extrinsic force being muscular or propelling force. All life forces probably are derived from or are resident in that fluid, and perform the most important primary functions to the entire organism, the brain and nervous systems performing secondary functions. The blood is the primum mobile of the organism. As already stated the nerves are but factors, on the one hand for the cells and on the other for the brain, or carriers of forces, sometimes termed vital, sometimes magnetic, nervous electric, or vis vitæ, *and so on.*

The brain is the leyden jar holding statical force, bottled up as it were, ready to be turned to use by act of the will upon the voluntary muscles causing contractions.

The nerves of involuntary motion are not under the direction of the will to any great extent, but are excited to action by the moving current of the blood, stimulating the heart and arteries by friction and oxidation causing magnetic and thermal disturbances sufficient to excite the nerves presiding over this system. The blood rushing to the lungs may stimulate the nerves of respiration, also independent of the will, both being sustained by duto dynamical battery, while volition is sustained by a statical battery, both contained in the brain and nervous system, each independent of the other so far as their special functions are concerned. When these forces are once spent on muscular contraction, as relaxation follows this force is dissipated or rendered inoperative, and may be of no further use in the economy, so far as we know, or it may be converted into some other force and again utilized in some way—who can say? As these forces pass along the motor canals there is no perceptible disturbance whatever in them, no sign or manifestation until muscle is reached where its power is spent, which causes muscular contraction and relaxation.

During muscular contraction there is an increase of circulation in the muscle, and a corresponding increase of oxi dation and nutrition and a greater amount of force generated, though itself imparts no additional power to the muscular act until it is sent up to the great nerve centres and returned again through the motor nerves to the part. As muscles contract they swell laterally, but not in proportion to the amount of shortening, in consequence there must be a certain amount of condensation, this may be proved by their rigidity during contraction. Our enquiry now leads to what is muscular contraction? We can imagine muscular polarity in the walls of muscular fibres themselves, by turning from a lineal to a lateral of 90 degrees so as to bring the poles of two together, thereby shortening in proportion to the

relative length and thickness of each molecule or groups of molecules.

In such cases the will makes and breaks the connection or polarity in voluntary muscles. Another theory might be given with some plausibility, that is that the will or nerve force, when sent to the muscle, drives out for the time being some other force or power of cohesion substituting a more subtle and finer force thereby occupying less space in consequence permitting the nearer approach of molecules by this substitution of forces; and whenever the will force is withdrawn relaxation takes place. We may also suppose the nerve force to be the more energetic of the two, but occupying less space among the molecules, but an increase of cohesive force or power, something similar to that of expanding and contracting of metals by changes of temperature alone, which determines the relative amount of cohesive force in such bodies which is directly as the mass and inversely as the square of the distances of atoms. Whatever muscular contraction may be, it is magnetic molecular disturbance no doubt, and what has been said of voluntary equally applies to involuntary motion of musclės, the difference being in batteries used, one statical the other duto dynamic, the force when in motion being the same, producing the same results on muscles, one acting rythmatically with marked regularity the other irregularly and spasmodically governed by caprice of will. What has been said of normal action may equally apply to abnormal or spasmodic action, one physiological the other pathological, owing to unnatural disturbance in the forces and unusual application of them overcoming the will.

There is one other hypothesis I will endeavor to account for, muscular contractility. As the sun passes the equator it acts as a disturbing cause on the otherwise static electricity, sending currents at an angle of 90 degrees towards the poles; it is this force that causes the needle to point north and south. Now, we will imagine the will or brain to act as a disturbing cause and send magnetic forces along the motor nerves longitudinally through the muscular fibres, *the same as the sun,*

directing currents laterally on all sides at an angle of 90 degrees causing cells in opposite fibrils to attract each other from about their centre bringing them in contact, and at the same time mechanically shortening and widening the cells; also a condensation of molecules gives rigidity to the mass; each cell would be shortened and widened, the transverse divisions of the cells being brought nearer together. The nuclei may be regarded as points of positive and negative polarity, and points of attraction.

The magnetic circles in the organism are established by the opposite sets of nerves as connected with the brain and meeting at their distal points.

The proto-dynamics originate in the cells caused by oxidation, also in oxidation of the moving fluids. All forces are economised and adjusted in the nicest and most accurate manner, so as not to suffer any unnecessary loss in the complex organisms of animal life.

To be Continued.

ARTICLE III.

Plaster as an Impression Material.

By Reuben K. George, D.D-S.

Plaster as an impression material is one of the most important, if not the most important, of all the minerals made use of in mechanical dentistry.

There are three other substances used for taking impressions, Wax of the animal kingdom, Gutta-Percha of the vegetable, and Paraffine of the fossil mineral kingdom. But plaster comes first on the list, and is of the mineral kingdom, being known in chemistry as sulphate of lime, (Symbols $Ca\ OSO_3$ or $Ca\ SO_4+2H_2O$ by the new notation,) more properly the sulphate of the oxide of calcium, because it first forms with sulphuric acid. It is known in dentistry as plaster or calcined plaster; to the agriculturist as plaster of Paris, from its having been originally found in large quantities, at Monmartre, in the environs of Paris. It is known

in commerce as Gypsum, and consists of twenty-eight parts of lime, forty parts of sulphuric acid and eighteen parts of water. It is found in large quantities in France, Nova Scotia and some parts of the United States. It is very often associated with rock salt, and also exists in four forms, Selenite, (which is a crystalline variety) Amorphous, Alabaster, and Fibrous. The amorphous is the variety prepared for the use of the dental profession.

Sulphate of lime is soluble in five hundred parts of cold water, and its solubility is slightly increased by heating the mixture; it is also more soluble in water containing chloride of ammonia or nitrate of potassa.

Plaster is also a useful agent in the dental laboratory for many other purposes besides taking impressions.

In preparing it for the use of the dental laboratory, the hardest pieces should be chosen and ground to powder, not too fine, however, for it is desirable to have some preparations of it fine and others somewhat coarse.

It then put into a large iron kettle and raised to a temperature of from 260°F. to 300°F. at which temperature it boils very much like water; just before the ebullition ceases the heat should be removed, and it then becomes what is known as calcined plaster. By this process of boiling or calcining, the water of crystallization is driven off to some extent, but it should not be heated higher than 300° or all the water of crystallization may be driven off, which converts it into an anhydrate which cannot be used in the lab oratory because its setting properties are lost; the very properties which make it so applicable to dentistry. Another process for preparing it, is to roast it in the lump in a furnace heated to 300° and then reduce it to powder. On the addition of water to the plaster it forms a batter which converts it into the same hard substance as before, by giving back its equivalents of water; it is then a hydrate.

Plaster has been in use as an impression material for full upper dentures for a great many years, and it has almost wholly superceded wax in all full cases, and is undoubtedly

the best material which can be used. It is now coming into very general use as a material for taking impressions for partial sets of teeth, as it can be used in the most complicated cases in connection with the gutta-percha mouth cup.

It possesses the property of taking a perfect impress of all the soft parts in their normal conditions and relations to each other, and from its great plasticity, it copies the most minute lines of the softest tissues, with perfect accuracy; a property which no other material possesses to the same degree. Another great advantage is the hardness which it attains in a short time and before it is taken from the mouth. One advantage which it possesses over wax and its compounds, or gutta-percha and its compounds, is that of being much more plastic when applied, therefore requiring very little pressure; it also becomes much harder in the same length of time. The advantage resulting from the slight pressure it requires is that parts are not displaced. Besides plaster is much more yielding when in a plastic state and much harder when it has set or when its affinity for water has been satisfied, than wax or gutta-percha.

In grinding plaster we should be careful not to grind too fine; and to grind too coarse would be equally objectionable. A proper way to judge of this is by rubbing the powdered plaster between the fingers.

In using fine or coarse qualities of plaster all the requirements of a good impression are not fulfilled: In the first place if the plaster is too fine, our impression will be too soft, and secondly, if the plaster is too coarse our impression will expand after it has been taken from the mouth, which will destroy more or less the relations of the parts to each other. The reason why the coarse plaster expands is, that the particles do not become thoroughly saturated with water until after the impression has been taken from the mouth; and afterwards absorbing their full supply of water, they are thereby more or less expanded. We should therefore avoid having our plaster too fine or too coarse, and should supply ourselves with two grades of this material for impressions.

In taking impressions where we intend to use the vulcanite base, it is advisable to use rather fine plaster, for the reason that the vulcanite plate will be an exact counterpart of the impression or model without any shrinkage or expansion. But for swaged work we desire a slight expansion of the impression, so that our model will be slightly larger than the parts of the mouth really are, and our reason for this is, that the contraction of the metal plate will just about counterbalance the expansion of the impression, hence the great advantage plaster has over all other impression materials.

Some of the other impression materials have a contractile power, but none possess the expansive power of plaster; which is a very essential property when we are constructing swaged work or teeth on metal base.

In taking an impression with plaster, we are not so liable to spoil it in withdrawing the cup from the mouth, nor are we so liable to get a rocking impression of the mouth, that is one which will cause the plate to press too hard on the roof of the mouth. When the plaster begins to harden there is not so much danger of its becoming displaced, as it rather adheres to the mucous membrane of the mouth. I contend therefore, that it is a great deal easier to take an impression with plaster than with any other material, for the accidents liable to occur during this process are very greatly reduced in favor of plaster. After the plaster has set we have an accurate impression, and there is no liability of destroying it by giving it a rocking motion in taking it from the mouth. This liability of destroying the accuracy of the impression in loosening and withdrawing it from the mouth, is open to all other materials for impressions more or less. Again a plaster impression when it has become hard, is not liable to disarrangement in removing it from the mouth, for we may break away some delicate parts, or, where there are undercuts, may disengage pieces, but these will all be broken with a sharp fracture, and can be placed in their exact positions, without destroying the integrity of

the impression in the least degree. Besides there is no danger of the dragging behind which is so great an objection to wax. In other words plaster possesses most of the requirements for a perfect impression material. If we were confined to any one material we should greatly prefer plaster, for wax and gutta-percha possess some advantages over plaster in special cases, where the parts of the mouth possess different degrees of hardness, yet in all these cases where the parts of the mouth are either uniformly soft or uniformly hard, plaster is to be much preferred. Now in cases where a part of the alveolus is soft and the rest hard, or where there are loose folds of mucous membrane, or where there is a soft ridge and a hard palate, or a hard ridge and a soft palate, wax or gutta-percha, possess advantages over plaster. For in such cases we wish to press up the soft or loose parts, so as to condense them to some extent, and hence the necessity for the use of wax or gutta-percha or some of their compounds. Now in choosing and buying plaster we are very likely to be deceived, for there is a great difference in the varieties met with as regards their setting properties, and it requires some experience to select the good from the bad. There are several simple methods however, by which we may judge of the quality of plaster. One way is to take up a handful and close the fingers upon it; if it adheres together like flour it may be considered a very good article, though it is not always best to depend upon this test. The surest test is to mix some of the plaster with a little water and time the setting by the watch. Plaster which will set in from three to ten minutes and become hard, may be considered as first class. The hardening of plaster may be divided into two stages; the first extends from the time the water is applied until it is too hard to take an accurate impress; the second extends from this time until it is solid. Now we may change these stages into long or short, by certain precautions in mixing; if we mix the plaster very thin it will be much longer in passing through the first stage, but if we mix it thick at first, it is longer passing through

the second stage. Now this difference in the time of setting is of great practical importance to us in taking impressions; for in preparing the plaster and putting it into the impression cup and introducing it into the mouth, we require the most time, and this of course reduces the time it is necessary for it to remain in the mouth, to become solid. Thus it is very nicely adapted for impressions in this particular.

In mixing plaster that will set in ten minutes, we may lengthen the first stage two minutes, By mixing it thin the first stage will require six minutes and the second stage four minutes, or *vice versa.* We also have it in our power to hasten or retard the setting properties of a given plaster, by mixing with it certain agents. For hastening the setting we add a small quantity of chloride of sodium or sulphate of potash, or we may make a weak solution of either of these agents and use them for mixing up the plaster. For retarding the setting we may use a mixture of dilute white glue, sugar diluted, molasses, water or beer. Calcined plaster should be kept in tightly closed tin cans, so as to keep the air from it, for if it is exposed to the air it will absorb moisture, which satisfies its great affinity for water, and consequently its setting property will be much deteriorated. The best time to place the plaster in the cup for taking an impression is just when it is stiff enough to build up, then when you can turn the cup bottom upwards and the plaster does not drop off, it may be inserted into the mouth; however, it may still be considered in a good condition for taking an impression so long as it leaves a glassy surface after passing the spatula over it; after this it is too hard, for on applying pressure it will crack, and press apart.

In mixing plaster, we may prevent the presence of air bubbles by first putting the water in the bowl and then by degrees sprinkle the plaster in from the blade of the spatula until nearly all the water is absorbed. When stirring we should be careful not to raise the spatula above the surface

so as to mix air with it, as air bubbles on the surface of the impression will destroy its accuracy. In using plaster we should also avoid letting it remain in the mouth too long, for after it has set it will absorb moisture from the mucous membrane of the mouth and will adhere very closely, causing considerable difficulty in loosening it, and much pain to the patient; sometimes the soft parts of the mouth are torn, or otherwise injured. We can always determine the exact time it will take a certain quality of plaster to set by experimenting and timing the setting, or by trying what is left in the bowl. When the plaster breaks with a sharp fracture it is hard enough to withdraw; but we should always make some allowance on account of the warmth of the mouth, which causes the plaster in the impression cup to set quicker than that which remains in the bowl.

ARTICLE VI.

Notes from Dental Practice.

CASE. 1.—*Treatment of Exposed Pulps.* Nature of case.—The cavity of decay on the anterior approximal surface of a superior second bicuspid tooth, the removal of the decomposed dentine exposing the pulp which was found to be in a perfectly healthy condition.

Treatment.—After carefully removing the carious portion and giving a proper form to the cavity for the retention of the filling, the next step inthe operation was the protection of the pulp. For this purpose recourse was had to the oxychloride of zinc, which was prepared by combining the powdered oxide with the liquid chloride in the form of a thick paste.

These preparations of zinc should be of the best quality, and thoroughly mixed together, so as to form a paste which does not present a watery appearance upon the surface; care must also be observed that the paste does not commence to solidify before it is introduced

In order that no time might be lost after the mixing of this paste to the proper consistency (as it rapidly hardens), the cavity was first dried, and then carefully protected from

moisture by requesting the patient to keep the napkin in place about it with his fingers. The paste as soon as prepared was applied directly over the exposed pulp on a small piece of soft linen of a size corresponding to the bottom of the cavity, both surfaces of this piece of linen being coated with it.

After the introduction of the piece of linen, the cavity over it was completely filled with the paste, and this temporary filling protected from moisture for about twenty minutes, this time being necessary for the proper hardening of the material. The surface of the filling was then made smooth with a burnisher, and to protect it for a still longer time from moisture, was painted over with a coating of sandarach varnish. Collodion also answers a good purpose for thus protecting the surface; these directions applying more especially to temporary fillings of these preparations of zinc, which are intended to remain in the teeth for some months.

An engagement was then made with the patient for the following week at which time it was determined to permanently fill the tooth should no untoward symptoms arise.

The tooth remaining perfectly quiet from the time the temporary filling was introduced, until that of the second engagement, the method pursued was as follows: All of the temporary filling, composed of the oxy-chloride of zinc, was removed, except that portion of it covering the bottom of the cavity, and immediately over the pulp, care being taken not to cut through this or in any way to injure it. When this was accomplished a gold filling was introduced by hand-pressure (as it was deemed unadvisable to use mallet-force in this instance), and the cavity thus permanently secured.

The application of the paste to the exposed surface of the pulp at the time of the introduction of the temporary filling, was followed by some pain, which, however, soon subsided.

This treatment of an exposed pulp, only promises success in cases where the organ is in a perfectly healthy condition, free from inflammation, or injury occurring in removing the decay. Where the exposed pulp is in a state of irritation palliative treatment should first be resorted to, and that above described be pursued when the former has proved successful.

CASE 2. *A Peculiar Form of Ulceration of the Gums.*

Nature of case.—Patient a youth aged 19 years who from childhood has been afflicted with diseased gums, the symptoms of the affection being as follows: The gums have a pale red and white color, are not painful but constantly discharging a fetid matter from about the necks of the teeth. They are not well festooned, and become irritable from slight causes; the patient also complains that in an hour after cleansing his teeth with the brush, they (the teeth) become dark and unsightly. This peculiar form of gingivitis was first described by Professor Harris, and has a constitutional origin, requiring constitutional as well as local treatment.

Treatment.—Constitutional.—One-half drachm of Chlorate of Potash was administered daily in divided doses of ten grains each, largely diluted as this salt is not very soluble.

Local.—During the administration of the Chlorate of Potash, the following local treatment was pursued: The edges of gums, about the necks of the teeth, were touched with a solution of Nitrate of Silver, three grains to the ounce of water, and the following gargle used frequently during the day: ℞. Potass. chlor. ʒ ij. Tinct. Catechu f. ʒ ij. Cologne water f. ℥ j. Aqua ℥ vj. Misce. This treatment was successful in arresting the progress of the affection, and so decided an improvement in the condition of the mouth has taken place that the patient, having discontinued the use of the Chlorate of Potash gargle, is using a simple astringent one composed of Borax ʒ j. Tinct. Myrrh f. ℥ ss. Honey f. ℥ j. Rose Water f. ℥ iv. Misce.

CORRESPONDENCE.

ARTICLE V.

15 RUE DE LA PAIX,
PARIS, *Mch.* 16, 1869.

To the Editor of the American Journal of Dental Science.

SIR:—

My attention has been directed to an article entitled "*A Novel Invention,*" published in the Editorial Department of the February number of "*The American Journal of Dental Science.*"

The occasion for some rather severe criticism is to be found in the following passage reproduced from "L'Art Dentaire."

"Mr. Evans proposes a new method of using nitrous oxide as an anæsthetic. It is administered in liquid state, and as it evolves itself in gas in the interior of the stomach it will produce the desired insensibility."

Such is the *reported* substance of a communication presented by me to the *Academie des Sciences!*

I am not so fond of error even of my own creating, as to be unwilling to receive a merited correction. But in this case, I must confess I sincerely regretted to see the "*Journal*" betrayed, by following the lead of an obscure publication into a Quixotic tilt against—nothing.

The fact is, the paragraph you translate so far as it purports to give a proposition of mine is entirely without foundation. No such proposition was ever made by me—no such idea was ever entertained. In the paper upon "Liquid Protoxide of Azote" which I submitted to the *Academie des Sciences* last August, after having described the process employed for liquifying the gas, I said—"The gas thus liquefied was drawn off through an escape pipe into a caoutchouc bag where it rapidly resumed its original volume and from which it was administered to the patient in the usual way." And again—"Besides, using the fluid protoxide of azote as a general anæsthetic by inhalation—availing myself of its great refrigerating power I have used it in several instances to

produce local anæsthesia. This can be accomplished upon any surface of the body by simply directing upon it for a moment the jet of vaporous gas as it escapes from the nozzle of the bottle."

The paper closes as follows:—"In a word, I have shown, 1st, that liquid protoxide of azote may be used as a general anæsthetic by inhalation, with the advantage over the gas in its ordinary form of greater purity, compactness and portability. 2d, that the spray of liquid of protoxide of azote is a most powerful and efficient local anæsthetic, with the advantage over other local anæethstics of greater certainty in its effects as also, that it may be applied without a special apparatus."

I presume it is hardly necessary that I should say more upon this subject--and I only regret that it has seemed necessary that I should say so much, to prove to the "*Journal*" and its readers the falsity of a statement, the improbability of which—I should have supposed, was sufficiently evident upon its face.

Yours very truly,

THOMAS W. EVANS, M.D.

SELECTED ARTICLES.

ARTICLE VI.

On the Necessity of Artistic Knowledge and Critical Taste to Highest Success in the Dental Profession.

By G. H. PERINE, D.D.S.

The art of healing, including medicine and surgery, of which latter dentistry is a special department, centres upon itself a wider range of collateral science than any other. It draws from every source of information something which can be applied to the alleviation of the miseries of mankind. Dentistry being only one department of the art, does not necessarily demand from its professors so wide a range of learning as medicine and surgery combined, but there are doubtless few who practice it that are as yet aware how far

the resources of the profession can be enlarged, by knowledge of principles and facts pertaining specially to other arts and professions. The object of this paper is to call the attention of the profession, especially its younger members, to the importance of the study of the fine arts, particularly that of portrait painting and modelling, with reference to the direct application of the knowledge and critical taste thus gained, to the practice of dentistry; and also to show how such application can be made to the rational correction of malformations and artificial deformities.

Comparatively few are gifted by nature with perfectly formed jaws and teeth, but in the present state of the art we should hesitate to avow that any ordinary case of malformation could not be corrected, and that without the sacrifice of teeth or the infliction of serious pain or inconvenience to the patient.

But natural malformations are scarcely more frequent than artificial ones caused by the injudicious and unnecessary extraction of teeth. It should be admitted as an axiom of modern dentistry, that *the extraction of any tooth from a young or old jaw, is certain to give rise to more or less permanent deformity.* Surely it is unnecessary at this day to substantiate this truth by argument. Every dentist has the proof at hand in the casts of jaws from which teeth have been removed. Let him compare the side of the jaw from which teeth have been taken with that in which the teeth remain, and assign if possible, any other reason for the difference, which is certain to be found.

Such deformity is much more likely to occur, and to assume exagerated proportions in young jaws, yet it is the constant practice of many otherwise excellent practitioners, to remove deciduous teeth, as though they were of no great consequence, thereby assuredly inflicting a lifelong injury upon the features of the little patient, unless a subsequent treatment shall avail to correct the injury. The plea for the practice is the correction of malformations, as when the teeth are crowded, and are growing "all awry," to make

room for the remaining ones. Without wishing or intending to be severe, I assert that it would be just as rational to remove one entire jaw to make room for the other, as to remove one or more teeth to give others room. Further on I shall describe a more rational practice; before doing so, however, I wish to show how artistic taste, and, if possible, manual skill in painting or modelling, will aid the dentist in correcting deformity.

In most cases in which the aid of the surgeon is invoked for the correction of deformity, a standard of comparison by which the amount of deformity can be determined, is at hand, in the corresponding opposite part. A few operations about the face are exceptions. In cases of talipes when both feet are involved, his aim is to equalize as far as possible both members. The dentist is without this standard in many cases of artificial distortion; the deformity on one side drawing out of their proper position the muscles of the face upon the other, so that no very accurate idea can be obtained in the ordinary mode of examination, of the real form of the features previous to the date of the defect. To remedy the defect so as to make the features *better*, should not be the limit of our ambition; we should endeavor while we have the matter in hand to so operate that the *best* expression shall be given to the features compatible with the character of those features upon which it is not our province to operate.

We are here working upon plastic material which we can mould and fix in any desired position; why then should we stop at anything less than perfection, if we are prepared to judge accurately what is perfection? It is my intention to confine myself in discussing this part of the subject to the importance of an application of the principles of art in the treatment of such cases as I have mentioned, not to write an essay upon art; yet I cannot forbear calling the attention of the younger members of our profession to the part which the lower features of the face perform in the general expression. A very slight distortion is sufficient to render an otherwise

beautiful face, almost ugly, as an experiment with an ordinary card photograph will easily demonstrate. Especially is this the case with the female face, the lower portions of which cannot be concealed by beard, and to which any deformity is a serious calamity.

I need not add that a dentist skilful in the correction of such defects, secures to himself a practice which although it may tax his patience, is certainly remunerative.

The distortions arising from the loss of teeth are in some cases so great that a comparison of the features with photographs taken before their extraction, will often surprise even one accustomed to making such comparisons. The extraction of the cuspids in childhood alters the features more than the removal of any others, yet these teeth are often ruthlessly sacrificed, by practitioners from whom a more rational practice ought to be expected. I have in my possession a photograph of a young lady now 24 years of age, who about two years since had the right upper cuspid tooth extracted. I am now treating her with a view to the correction of a marked distortion resulting from the loss of that tooth; a distortion so marked that it has been a source of great mortification to the patient. The face is drawn to the right and, what upon the evidence of the photograph alluded to were once remarkably well-formed and expressive features, have been most sadly, though I trust not irreparably marred.

In cases of this kind, a photograph of the patient taken previous to the loss of teeth, is an invaluable guide to the dentist in correcting the defect. But it often happens that such a guide cannot be obtained. When this happens his power of analysis, and his artistic taste and knowledge are taxed to determine as far as possible from those portions of the general contour which remain undeformed, what must have been the natural form and expression previous to the occurrence of the deformity. And I assert that with a rational method of treatment, and all other things being equal, success in this difficult department of the art of den-

tistry will be in proportion to the artistic taste and judgment of the practitioner.

In cases of this kind I have been uniformly successful without recourse to the extraction of teeth, and I now proceed to give as briefly as I can my method of treatment. I do not claim this method as entirely original with me, although I might claim to be the inventor of some of the details. I shall content myself however with a mere description of the mode of practice which I have found the best, leaving it to the profession to judge how far I ought to be credited with any of its feature.

In treating these cases, I begin with the upper jaw, and as the principles involved are the same for both the upper and lower jaw, the description of the process need not comprise the latter; I first fit a rubber plate to the roof of the mouth in the usual manner, and insert in sockets formed upon the borders of this plate, pins of compressed hickory corresponding to each tooth which it is desired to assume a more outward position. As soon as these teeth have yielded to the pressure so that the pins are loosened I substitute for them others which renew the pressure until they have yielded as far as may be requisite.

While the above process is going on, I at the same time compel the teeth which stand too far out to fall into line, by the following means: In the centre of the rubber plate above described, are inserted small hooks of platinum. Over these hooks I loop a small rubber band, (the small elastic bands used for holding bundles of tickets, etc., together, and of which I keep a supply on hand answer the purpose perfectly) and also loop it over the tooth whose position I wish to alter. These bands are the best things I have ever used for the purpose, their elasticity, and their softness being strong points in their favor. They can be renewed as often as required by the patient, and can be worn without any serious inconvenience.

By the means described the teeth are expanded or drawn in until they stand as regular and even as desired. But at

this stage of the treatment the axes of the teeth extended would all meet at the apex of a cone of which the cusps of the teeth form a portion of the perimeter of the base.

Occlusion between them and the lower teeth is only partial, or wholly obviated. How then shall the jaw be expanded so that the fangs shall be thrown out and the teeth be made to assume their normal relations? I have found no difficulty in accomplishing this by the following means.

I fit a new plate to the roof of the mouth, forming upon it artificial cusps corresponding to the teeth in the lower jaw; upon these cusps the pressure of the lower jaw is received in the mastication of food, and more or less at all times and transmitted to the arch of the plate. A general expansion of the bones and tissues is the result. The whole jaw is enlarged, and the work is complete.

I am aware that many will doubt that these simple means will accomplish so much, but let those that doubt remember that the bony structures are plastic in their nature; especially so in youth; and that this plasticity if ever lost, is retained until late in life

Let them make the experiment and convince themselves, it will require patient attention perhaps, for many weeks or months; much reasoning with over fond parents to keep the apparatus applied with sufficient constancy, to secure a good result; but with favorable conditions, the results need not be doubtful; nay, they may be as certainly relied upon as those of any other operation in modern dentistry.

I use rubber plate in preference to any other, because its effects upon the teeth are more harmless, and its rigidity is ample.

In conclusion I desire to urge upon the younger members of our profession a candid consideration of the value of art culture. Although in our own day but little may be accomplished, the time is coming when this department of our art will assume an importance little dreamed of by those who are content to tread in the old beaten path, and by whom any attempt at advancement, is regarded as an unwarantable innovation.—*Med. Gazette.*

ARTICLE VII.

Good and Bad Teeth.

In one of the scientific almanacs of Great Britain for this year, we find the following article.

The best advice to those who wish to preserve a sound set of teeth to old age, (a most important aid to general health) is that they should be carefully brushed and thoroughly cleaned *after* every meal, and particularly on going to bed at night—surely a far more reasonable practice than rising, when the mouth should be fresh and sweet in a healthy state, a luxury which we fancy is but seldom enjoyed by the smoking and grog drinking gentry of the present day.

Still, either for want of care, or perhaps sometimes in spite of care, toothach is to great numbers of people one of the most vexatious among the minor scourges of life, and no disease of a simple nature so completely mocks the efforts of the profession and the quacks, and baffles all their vaunted remedies and specifics. The art of dentistry has of late made an immense stride by the general introduction of nitrous oxide as an anæsthetic. That this will prove successful in relieving the hitherto frightful pain of tooth extraction is, we believe, almost beyond a doubt, and there seems every reason to believe that it will prove a safe application as well as an effectual one. Extraction, however, is not an advisable course to pursue, except those which are, of course, better out than in, and it is often practiced in cases which render it completely absurd. To our damp and variable climate is doubtless due much of the prevalent neuralgia of the country, and a cold in the face, to which some people are especially liable, is also to be traced to the same cause. The homœopathists, we believe, have had considerable success in the treatment of that form of the latter which is characterized by soreness and inflammation, by the administration of mercurius vivus, of course in dilution. Of this, however, we know but little, but we are very confident of the value, in cases of every kind, of the following dose in

two pills, at least, as preparatory to the cure:

℞.	Pil. hydrag.,	gr. v.
	Pil. rhei co.,	gr. v.
	Ext. belladonnæ,	gr. 1-8.

In cases of colds in the face, the old fashioned application of a "pepper plaster" has almost invariably a soothing effect, though its success is unfortunately attended with but little profit to the druggist. It consists merely of a piece of brown paper almost as large as the cheek, soaked in vinegar and well sprinkled with pepper, secured over the face during the night.

Neuralgia is to some extent independent of the teeth, though where these are perfect, its visits are not near so probable, nor so frequent. There are two forms of this wearying complaint, which are totally distinct, and yet which are frequently confounded. One, and this is we are convinced by far the most common, is the pain resulting from some trifling cause, or perhaps directly traceable to none, when the nervous system is in a state of more or less complete prostration, and when the manifestations of this debility are chiefly in the facial extremities. In cases of this kind *opium* and all its preparation should be most carefully avoided, and a purely tonic treatment is required. Quinine is not by any means the best tonic we possess, and in these cases is far inferior to iron—especially the sulphate. But in neuralgia proper—that is, in its intemittent form—quinine unquestionbly ranks first, not, be it understood, from its tonic virtue, which is, as we have said, inferior to that of many other medicines, but from its special property as an anti-intermittent. In such cases as these, indeed, pure tonics—iron, for example—have little or no effect, while next to quinine, arsenic is perhaps the best remedy, and this has no tonic value whatever. One or two drops of Fowler's solution given alternately with one or two grains of quinine, at rather frequent intervals, is often very efficacious, though we need not say that the utmost care is necessary to guard against an over-dose of such a poison as arsenic.

We have made these remarks because we regard the treatment of toothache and neuralgic affections as a tolerably fair portion of a druggists practice at the counter. It is generally a most extensive portion, and we need hardly say that a man who can acquire the reputation of being able to cure the toothache is a man who must command esteem. The experience of an intelligent chemist will be sure to have led him to know much about these complaints, but it may be that the hints we have thrown out above may add an idea to some who wish to be as successful as possible even in their transgressions of etiquette, and while the writer deprecates most strongly the unauthorized assumption of general duties by those who have not dared, or at least, have not chosen to submit their abilities to a fair test, such as is prescribed by the law of the land, but have relied on their own natural "unerring instinct" in the treatment of all sorts of diseases, he is still slightly tempted to regard these minor complaints somewhat as the public does—viz., fairly in the province of the chemist and druggist.

In addition to the above remarks, we have been favored with the following, from a practical dentist of great experience, and, though his opinions somewhat conflict with our own in one or two instances, we gladly insert them for the sake of their presumptive value. First of all a very important point to remember is that the teeth should always be cleaned with warm or tepid water, or, better still, with a cool tea, the tannin of which exerts its astringent properties on the gum. The *rationale* of this observation is that the enamel, being mechanically brittle and usually warm, the sudden application of cold water to this is very liable to cause it to crack —a condition which is very frequently met with.

Real cases of neuralgia are much more rare that is generally supposed. A disease which is frequently mistaken for it is what is technically known as *exostosis*—that is, a particular granular enlargement of the fangs. This state is usually met with about the spring and fall of the year, and is the occasion of the violent pains in the nerve-centres, shooting

from the temples to the neck, which are generally, like neuralgia proper, intermittent in their attack. Sound and decayed teeth are equally liable to this condition, and nothing but extraction or patience can be of any effectual aid in removing such a disorder.

Inflammation of the periosteum is one of the most general causes of toothache, and is a usual consequence of cold. The periosteum is the fine membrane covering the fangs of the teeth, is highly organized, and is, therefore, exceedingly sensitive. To abate this inflammation a small dose of mercurial pill, with not more than the eighth of a grain of extract of belladonna, should be given night and morning. Warm fomentations ought to be frequently applied, and every care taken to prevent the further influence of cold. In many cases a leech on the gum will very readily relieve this form of toothache.

Speaking very exactly, toothache is an inflamed state of the central nerve of the tooth. As a rule, it may be considered impossible for this nerve, or the pulp of the tooth—that is, its main portion—to become affected in this manner until after the enamel has been partially or entirely removed. The best application in such cases is, after thoroughly cleansing the hollow with a small piece of cotton, and afterwards disinfecting with creosote, to plug with a pellet of wool soaked in a saturated solution of gum benzoin and tannin in chloroform. The well known Bunter's Nervine appears to be something similar to this solution.

In the management of the teeth, too great prominence cannot be given to perfect cleanliness. All foreign particles should be carefully removed after meals by the use of a tooth brush, or where this is not sufficient, a tooth-pick, made of soft wood, is admissible; but those formed of metallic or other hard substances should be avoided. A saponaceous tooth-powder is the most serviceable, if any be employed. The dentist should be as conservative as possible; extraction is seldom necessary if he be skilled in his art; exostosis and abscess at the fang being, however, diseases which im-

peratively require this to be resorted to.—*Med. & Surgical Reporter.*

ARTICLE VIII.

Devitalizing the Dental Pulp, and Treatment Preparatory to Filling.

By Dr. I. P. Wilson.

When teeth are so badly decayed as not to admit of a chance of saving the pulp alive, I have practiced the following treatment with gratifying results.

And in writing on this subject, I shall particularize for the benefit of those who have no regular method of treating such teeth, and consequently have poor success, if not entire failure:

Before treatment I remove but little disease from the cavity—perhaps only syringe it out with warm water. If it is an approximal and the decay extends below the margin of the gum, it is important that an application of sandarac varnish be made to that portion of the gum exposed to the cavity, that the absorbents may be closed. If this precaution is not observed, the arsenious acid will act upon the surrounding parts, pericementitis will follow, and failure is a probable result.

This being done I take a small pellet of cotton, moisten it with creosote, touch one side of this to arsenic, (either dry or in paste) and apply directly over the pulp.

Another pellet of cotton saturated with sandarac varnish should be in readiness, and applied over the first, filling the cavity full. This will harden, and prevent the arsenious acid from escaping into the mouth and doing injury.

I now dismiss my patient with directions to call again in just 24 hours. At the expiration of this time I remove the sandarac plug, and almost invariably find the pulp dead, so that it can be removed with little or no pain.

At this sitting I generally prepare the cavity for filling, by removing not only the bulk of pulp, but the nerve ves-

sels in the dental canals, so far as it is practicable to do so; and in order to do this, I sometimes find it necessary to enlarge one-third or one-half the length of the canal with a bur drill, that I may gain access to the root vessels, and thereby make the operation much more thorough, and I believe productive of better results.

But we frequently find the nerve vessels alive, and quite sensitive, but the pain is only momentary, and generally ceases as soon as the instrument is withdrawn.

In such cases I have been in the habit of entirely extirpating these vessels if possible, believing if this is not done, they will afterwards perish, and become foreign matter. This may be done with a broach, or by making a second application with the arsenic. The former I consider a much better way, and always practice it when my patient will allow me to do so.

In using arsenic a second time, it circulates more generally throughout the entire structure of the tooth, reaching perhaps the nutritive vessels of the periosteum, and thereby cutting off all nourishment to the tooth, and it becomes necrosed. I do not believe that a second application of arsenic will produce such results as this as a rule, but it is *liable* to do so, and therefore barely enough should be used to accomplish the object, and *no more.*

The cavity being prepared, I rinse it with warm water, dry it thoroughly, and then force creosote into the canals on very small pieces of cotton, or thread is better, as one end of it can be left in the outer cavity, by which it can be removed very readily.

This being done I request my patient to call again in a week or ten days. I then remove the temporary filling, and ascertain the condition of the tooth.

If it should be elongated, and concussion produces pain, I would not plug, but commence treatment for pericementitis. And if the small piece of cotton or thread in the root canals should produce a fetid odor, and indicate an unhealthy condition, I would not think of filling, but would rinse out the

canals thoroughly with warm water, and again apply the creosote, and so continue to do from time to time, until a normal condition is present. But if on removing the temporary filling, I find the tooth in a good condition, I proceed at once to fill the canals (if I have gained access to them), and then the main cavity.

In cases of this kind where an expensive gold filling is required, I think it best as a general rule to put in a *test* plug at first, and then if all is well, fill it with gold from two to to four months subsequently.

But a word in regard to these *test fillings:* When the oxychloride of zinc is used for this purpose, it is simply *no test at all*, as it is very porus, and the gases can easily escape through it. I would therefore prefer Hill-stopping for this purpose, or at least I would close up the openings into the canals with the Hill-stopping, and then the oxychloride may be used for the balance of the filling if it is preferred.

This has been my method of treating such teeth, and I have very seldom had any further trouble with them.

I do not know that I am offering anything new on this subject, but I trust the above suggestions may serve as a guide to those who have heretofore been unsuccessful in the treatment of such teeth.—*Missouri Dental Journal.*

ARTICLE IX.

Dentine.

By Prof. HENRY S. CHASE, M. D.

Dentine is that anatomical element of which the great mass of a tooth is composed. It gives shape to the crown and the roots. In the crown it is covered by the enamel, which extends as far towards the roots as the neck of the tooth, a little below the margin of the gums. In the roots, it is covered on the outside by the cementum, which latter is composed wholly of osteal cells. The nerve or pulp canal, which passes through the roots, is lined also with cementum for a short distance from the foramini of the roots, towards

the crown ; thus covering the internal surfaces of the dentine in the roots with osteal cells.

Dentine is composed of tubes opening on the interior of the tooth, or that chamber which is called the pulp cavity, or nerve cavity, and which contains the pulp of the tooth. The direction of these tubuli is from the pulp cavity towards the exterior of the tooth, radiating and giving off smaller tubules as it passes along, like the branches of an artery. Some tubes give off no branches, but run in an undulating manner, without branching, until they terminate at the base of the enamel.

The dentine tubes in the roots make connection with the canaliculi of the cementum cells. The tubules carry the colorless blood to every portion of the tooth, thus giving it nourishment. There are no vessels carrying red blood into the dentine, or capable of doing so, even in inflammation, for the diameter of their interior is not more than the ten thousandth part of an inch. The dark appearance sometimes observed in teeth is owing to disintegration of the blood discs, which may then permeate the dental tubule.

The blood which the latter receive comes from the vessels of the dental pulp, principally, although some is received from the cementum cells, which lie in close connection with the pericementum or dental periosteum.

Besides conveying nourishment to the enamel and intertubular dentine, the tubes contain nerve fibrils, which are received from the dental pulp, and these nerve fibrils run the whole length of the tubes.

It has been observed that the tubes penetrate the enamel in some instances, running between its roots nearly to the surface. This fact accounts for the pain often felt in a tooth unaffected by decay, from the contact of acids, of sweets, and from the pressure between the teeth of woolen cloth and some other substances.

The microscope has not actually demonstrated that the fibrils are nerves. But it has been demostrated that every dental tubule contains a soft fibril which may be drawn out

of the tubes to a considerable extent before being broken off. Facts in dental physiology and pathology make it almost certain that these fibrils are true nerves.

There is an inter tubular substance in dentine which is wholly composed of lime salts. These territories are without sensation. There are no fibrils there. In dental decay we find portions of the cavity very sensitive to the touch of an instrument, and other parts totally without sensibility.

The history of dentine shows that a tooth is not dead when the pulp is dead and removed from the tooth, as we have seen that the dental tubes anastomoze with the canaliculi of the cementum; and the cementum cells are nourished from the periosteum of the roots with which they are united. Observation has taught us that a tooth may be sensitive after the removal of its nervous pulp, the dentine, within a cavity of decay, proving extremely sensitive to the touch of an excavator in some instances, thus showing the presence of nerve fibrils, received from the pericementum or dental periosteum.—*Medical Investigator.*

ARTICLE X.

Some Unusual Phenomena attending Anæsthesia.

By FREDERIC D. LENTE, M.D., of Cold Spring, New York.

In a recent number of the *Richmond and Louisville Medical Journal*, and copied into the *Boston Medical and Surgical Journal*, is an article by Dr. W. H. Shepherd, entitled "Apparent Exercise of Volition during Anæsthesia complete in all other Respects." The writer thinks it very extraordinary that, although the anæsthesia was apparently perfect, the patient's jaws were firmly closed. "The resistance," he says, "was not such as we find in tonic spasm, but appeared to be the result of voluntary effort, and never yielded, although the anæsthetic (chloroform) was used until the condition of the pupils forbade its further employment." There was, he adds, the usual relaxation of the other muscles of the body.

A rigid condition of certain muscles, under perfect anæsthesia, is not, I think, so very uncommon, and even the perfect exercise of volition is also quite possible, as I have seen exemplified in two cases so remarkable that I am tempted by reading the report of Dr. Shepherd's case, to give them publicity, although the long period which has elapsed since their occurrence, and the possession of no notes, must render the report very meagre.

During the first year of the use of anæsthesia in the New York Hospital, to which I was, at the time, temporarily attached, as surgical assistant, a case of perineal section occurred in the practice, I think, of Dr. Gurdon Buck. The operation was without a guide through the stricture, and the most tedious and difficult of the kind that I have ever witnessed. The patient was on the table over an hour, and the exemption from pain was, all the while, complete ; and yet he was laughing and talking, and making droll remarks, in conversation with the bystanders, most of the time. I remember one of the house staff making notes of some of his queer sayings. The other case was a tedious operation for necrosis of the tibia. The subject was an unusually stupid boy, some fifteen years of age; and yet, under perfect exemption from pain (etherization), he sang numerous comic songs, and made rather witty remarks on the peculiarities of the surgeons around him. The pain, on examining the disease with the probe, previous to the operation, was unusually severe, judging from the outcries of the patient. I cannot remember how often a reapplication of the ether was required, but the sponge was away from the face a good part of the time consumed in the operation. These cases were not deemed extraordinary at the time, and no note was taken of them, as it was then the infancy of anæsthesia, and it was considered quite likely that these events would become not unusual occurrences. But I have never since, to my recollection, met with a record of any thing precisely similar, although it is sufficiently common for patients to recover their mental faculties to such a degree as to enable them to

answer questions intelligently, and to cooperate, to some extent, in any necessary movement of the body after the operation has been completed some minutes, and yet feel no pain during the handling and dressing of the wound.

Two cases of troublesome rigidity of muscles, which I call to mind as having happened in my private practice, are briefly as follows: Mrs. N., a rather nervous married lady, about thirty years of age, had visited a neighboring village for the purpose of having a number of teeth extracted; and, according to her statement, had exhausted a pint of ether in the vain attempt of a physician to anæsthetize her. She was assured that such a thing was impossible in her case. However, I undertook the job, and with three ounces of ether, and within the space of four or five minutes (ether enough and time enough to etherize any patient) I had her breathing stertorously, and thoroughly relaxed except the muscles which it was most important to have in that condition, namely, the masseters. It required a strong leverage with a pair of stout forceps to force the jaws open, so that Mr. Davis the dentist in attendance, could extract the teeth. On recovery she exhibited no unusual phenomena, and insisted, for some time, that it was her sister, standing by, and not herself who had undergone the operation.

A young man, and healthy, who had suffered amputation of the leg below the knee some months previously, wished a peg-leg, but the knee-joint was anchylosed in the straight position, and required to be flexed for this purpose. I accordingly administered ether to relax the muscles, as well as to annul pain. The anæsthesia was quite complete, the respiration stertorous, and yet the muscles of the thigh were as rigid as iron. The etherization was pushed to the verge of danger, in the hope of producing relaxation, and thus maintained for several minutes, but unsuccessfully. The patient was therefore allowed to recover somewhat from its effect; and before the return of consciousness or sensibility, the muscles then becoming slightly relaxed, the stump was suddenly flexed by a powerful effort on my part, and the adhe-

sions thus ruptured. In this case, I cannot call to mind whether the other muscles of the body were likewise rigid.

In fact, the untoward and perplexing effect of the anæthetic was so annoying that I paid no particular attention to the state of the general muscular system. I cannot pretend to say whether voluntary effort had any influence in determining the muscular contraction in these two cases. A *moderately* firm contraction of the maxillary muscles is not an uncommon occurrence in dental operations under an anæsthetic.—*New York Med Journal.*

MONTHLY SUMMARY.

Comminuted Fracture of Nasal Bones and Right Superior Maxilla; Sinking of Eyeball into Maxillary Sinus.—Dr. Langenbeck gives an account of a railroad official whose head was caught between a locomotive and its tender. The eyelids were torn away from the orbit, and a deep wound ran down from the inner canthus to the upper lip. A probe could be passed into the antrum, not a trace of the eyeball could be be found; while in the orbit was a bluish-black pulsating mass. The nasal bones comminuted. Patient conscious, but sleepy, pulse slow, violent pain on right side of head. A week afterward, as head-symptoms disappeared, and the extravasated blood had been somewhat absorbed, a closer scrutiny could be made. The eyeball was discovered to have escaped from the orbit into the antrum by a hole, in the orbital margin of the upper jaw, big enough to admit the finger easily—the axis of the eye standing vertical, the cornea downward.

The fragments of bone were adjusted as well as possible, and the eyeball replaced in the orbit. It was uninjured, and vision was perfect.

About ten weeks after, by two blepharoplastic operations the eyelids were brought into a tolerably good condition. They could be closed, and usually so remained, but could be opened enough to expose the cornea and permit sight. The globe was however perfectly immovable. About five months after the injury, ulceration and suppuration of the cornea occurred, and the globe atrophied.—*New York Med. Journal.*

Dentistry in Japan.—In some interesting notes on the state of Medicine in Japan, Dr. Alex. M. Vedder writes (*Am. Jour. Med. Sci:*) "It might not be amiss, in the course of these remarks, to add a few words concerning a kindred profession to our own. I refer to dentistry. This *trade*, for such it may be more fitly considered in Japan, is carried on by a very low class of people, usually peripatetic in their habits, and who carry with them a box covered with brass ornaments, by which their occupation is recognized. Now, the extraction of a tooth by one of these gentry is regarded by the Japanese as a capital operation, and not without reason, if the information given me be reliable, that death (from tetanus, I presume) is not unfrequently the result. The tooth is extracted by the operators fingers, but not until it has been well loosened by means of a stick and a mallet vigorously wielded. The operation is seldom performed, but I saw some teeth in possession of one of these charlatans that had large portions of the alveolar process attached. In the face of these facts it can scarcely be credited that artificial teeth, sustained by *atmospheric pressure*, have been in use from time immemorial. These teeth are carved out of sea-horse ivory, the molars being plentifully studded with little brass bosses, and the whole stongly mounted upon a base cut from the hard shell of a species of gourd, and carved to conform to the irregularities of the gums and palate. I have several sets of these teeth in my possession; they are not expensive, the very best, a complete upper set, costing about five boos, or about one dollar and sixty cents. Colossal fortunes are not accumulated from dentistry in Japan, as may be inferred from the foregoing.—*Med. Gazette.*

Plaster Impressions.—H. C. BARTLESON in the *Dental Register*, describes his method as follows: I select the cup most suitable and take an impression in wax in the usual manner, only that I make no attempt to get the roof of the mouth perfect, save where the posterior border of the plate is to come, and I draw it in the manner indicated to secure as perfect an impression of the teeth as possible. Then before the wax is cool, I trim it with a warmed knife, cutting off all that projected beyond the cup posteriorly, and shave away to the depth of an eighth of an inch all that which came in contact with the gum and hard palate, except at the posterior border of the impression, when I leave about a line's

breadth, (to keep the plaster from running down the throat)and that which is close to the teeth, to preserve their form. The surface thus made I roughen by coarse scratches for the plaster to fasten to. Thus prepared, I re-introduce the now cold impression, to see that it has not been changed, and to observe the best manner it is accommodated to the the teeth. I then pour the plaster where the wax has been removed to the amount that will slightly exceed the quantity of wax which was shaved away, and proceed in the usual manner of taking plaster impressions, pressing it firmly home. All excess of plaster will pass out over the gum where the teeth have been removed. I allow the plaster to become perfectly hard, having no fear of its being held by the teeth, as it does not come in contact with them. This method secures the accuracy of wax around the teeth, combined with the perfection of plaster for the palatine surface and gums.

BIBLIOGRAPHICAL NOTICES.

Atlas zur Pathologie der Zahne. Bearbeitet von Weil. Prof. Dr. M. HEIDER und Prof. Dr. C. WEDL. Die Zeichmungen Sammtlich nach der natur aufgenommen von D. C. Heitzmann. Leipsic, London and New York.

Two numbers of this Atlas to the Pathology of the Teeth, arranged and explained by the late Prof. Dr. M. Heider and Prof. Dr. C. Wedl, with drawings from nature by Dr. C. Heitzmann, have been issued, which are the first, we understand, of a text book on dental pathology.

The two numbers contain eight folio pages and eighty-one well executed lithographs of preparations from the pathological collections of Prof. Heider. Two more numbers complete the work, which will prove a valuable one to every dentist and dental student.

Prof. Heider was for many years a prominent instructor in the Vienna University, and Prof. Wedl, who has contributed valuable monograms to science, has arranged the atlas and text, which is in both English and German, from the valuable collections left by Prof. Heider.

A work of this kind will supply a want long felt, as no complete one devoted wholly to dental pathology exists.

The Life of the Trichina.—By Rudolph Virchow, M.D.,Ph.D. Professor University of Berlin. Translated by Prof. Rufus King Browne, M.D. A pamphlet of forty-eight pages, containing a full description of this microscopical parasite. Commencing with the history of the trichina this work investigates the

following queries: How do we recognize trichinæ in meat? What dangers to the human body do the trichinæ cause? What preventive measures against its spread are advisable? The three cardinal points elucidated are: 1. The eaten Trichinæ remain in the intestine, and never enter the muscles. 2. They produce living young, which enter the muscles. 3. The young which have entered the muscles grow there but do not multiply. The main danger, therefore, is in the production of young by the intestinal Trichina.

EDITORIAL DEPARTMENT.

Salutatory.—With the present number we commence Vol. III. of the Third Series of the *American Journal of Dental Science.* It is well known that this *Journal* is the oldest periodical in the world devoted to the propagation of the principles upon which Dental Surgery is founded; and it is not going beyond the truth to assert that this *Journal* was one of the most important agencies in the elevation of the dental profession to its present position of usefulness and influence. In proof of this we may refer to the account of the rise and progress of Dental Surgery in Harris's "Dictionary of Medical Terminology, Dental Surgery and the Collateral Sciences," the present edition of which was revised by the writer: "Until 1820 Dental Surgery had made but little progress in the United States; since that period its advance has been more rapid. In 1839 a periodical devoted to the interests of the profession, "The American Journal of Dental Science," was established. In February 1840 the Legislature of Maryland chartered the Baltimore College of Dental Surgery, and in July following, the American Society of Dental Surgeons was organized. The combined influence of the Journal, the College, and the American Society, gave an impetus to the Science which it had never before had, and contributed in an eminent degree, to the dignity and respectability of the profession."

The object of the editor in undertaking the duties and responsibilities devolving upon him, is to make the *Journal* an exponent of the status of dentistry, and a medium by which members of the profession can communicate their ideas to their fellows, and thus diffuse information and cultivate the habit of imparting it.

A generous co-operation from the members of the dental profession throughout the country is therefore respectfully solicited; and it will be the aim of the editor to make the *Journal* thoroughly practical, and to furnish its subscribers a faithful record of all improvements as fast as they are made known by their authors.

As the Journal is issued on the first of each month, its readers

will be kept well informed as to the progress of the Science; the latest inventions will be duly noticed, and all suggestions impartially discussed, and every effort made to advance the best interests of the profession.

Communications are respectfully solicited on all subjects pertaining to the practice of dentistry, as well as reports of cases occurring in dental practice, proceedings of dental Societies, &c.

Want of cultivation in the habit imparting information, need be no excuse for neglect in making known important cases met with in practice, as due care will be taken that all communications appear in a proper form. All, therefore, may assist in advancing the interests of the profession, and at the same time add to their own reputation.

Southern Dental Association.—In the March No. of the *Journal* we briefly noticed the unjust charges made against us by J. H. McQ—in the *Dental Cosmos*, for our efforts to enlist the co-operation of Southern Dentists in the formation of a "Southern Dental Association."

Judging it best for others, who have been longer identified with the "American Dental Association," and more conversant with its proceedings, to notice at length the criticisms of J. H. McQ. our answer was confined to a mere defence against the charge of improper motives in advocating the formation of another association.

Dr. W. H. Morgan of Nashville Tennessee, who has for a number of years been one of the most prominent members of the American Dental Association, and who is thoroughly conversant with its private as well as public proceedings, replies to J. H. McQ. in the Feb. No. of the *Dental Register*, and brings forward such an array of facts as to prove conclusively that the statements we first published in the Journal were altogether correct.

We trust this reply of Dr. Morgan may be read by every Southern Dentist, and in order that it may reach all our readers we publish it in full;

MR. EDITOR: In the *Cosmos* for January, 1869, under the above caption, there are some criticisms that deserve a passing notice, on account of their manifest unfairness and perversion of facts. J. H. McQ. quotes: "The impression has become general among Southern Dentists that sectional feelings govern the action of the majority of the American Dental Association." True, sir. And then says: "It would be unjust, however, to permit such unfounded statements to pass unanswered. To refute this it is only necessary to turn to the elections of officers for the past few years," and goes on to enumerate five gentlemen who have been elected to office from the Southern, or late "slave-holding States." "The evidence," he says, "thus presented of the absence of sec-

tional feelings is overwhelming, for, although the attendance on the part of Southern practitioners has been limited for other reasons than those that are given above. The proposition of officers each year has been *decidedly* in their favor," and quotes what he said at Chicago as a "settler to this question." "We have come hundreds of miles away from home, let each and all, therefore, turn out the silver lining of their manhood,etc." Let us examine as to the officers. This Association has had eight elections of officers, forty-eight in all, and up to this date two Southern, just two Southern born men, (the writer and Dr. Rodgers, of Kentucky) and no more have been elected to office in the Association. The others whom he names as being Southern men are from the North, and most of them are what, in common parlance, are termed "Yankees," and have simply "emigrated South." Some of them have boasted to the writer that they were live Yankees. So two in forty-eight is decidedly in their favor. This has not been the result of accident, but of preconcerted action on the part of Northern members, so he says, (who doubts it?) but not for the reasons assigned. This Association was organized in Washington City (Southern soil) and has never met in a Southern State since that date,(1860) although frequently invited and urged by Southern delegates to do so. Why? Because it has been controlled by the "action of a majority of its members," who are Northern men, and for reasons satisfactory to themselves the place of meeting has been fixed in some of the Northern States. At the meeting in Chicago, when J. H. McQ. so eloquently exhorted his brethern to "to turn out the silver lining of their manhood," and while the name of the writer was before the nominating committee, he was approached by a member of that committee direct from the committee, and his politics asked. It was not doubted that the committee sent him. And again immediately after the election of officers another member of that committee approaching him, said, in an apologetic tone and manner, "I voted for you, and you would have been elected but for some doubts as to your loyalty, but you know, sir, this is a National affair, and it would not do to elect any one to an office in it but Union men."

The next year at Boston, the writer in the chair, a motion was put and carried to invite General Butler to visit the Association. When the nays were called for some one voted nay rather loudly, when a Northern brother, in a rather boisterous tone said, "Some of us are abolitionists, let him come in." The offensive manner in which this was done was unmistakable. After General B. retired from the hall, a resolution was offered and passed, "That this Association is happy to see and hear Major General Butler," etc. (See proceedings, p. 241, with protest, which reads, "The undersigned members and delegates to the American Dental

Association earnestly protest against the action of the majority of this body in refusing to reconsider the vote by which the above resolution was passed. The ground of our protest is this: The subject matter contained in said resolution we regard as wholly foreign to the objects for which this body was organized.") This protest was signed by ten delegates. While the motion to reconsider was pending, J. H. McQ. "turned out the silver lining of his manhood," by making a speech against it, and thereby defeated it by a small majority. A manly, generous appeal was made in its favor by L. D. Sheperd, of Boston, Massachusetts, and an entreating one by F. Y. Clark, of Savannah, Georgia (he who boasts the secret service medals given to him by General Wilson and others of the U. S. Army.), but no appeals would avail. The resolution was spread upon the minutes and published. And yet J. H. McQ. says: "And those who have attended the meetings from that section (South) and participated in the proceedings, will acknowledge that other than sectional or political questions have *fully* engaged the time and attention of the delegates." In the face of the above facts 'they will make no such acknowledgment. This, Mr. Editor, is the manner in which "year after year the olive branch has been cordially extended by the Northern members of the Association to their professional brethern in the South.

Without inquiring into the motives of one making such erroneous statements as quoted, we place these facts before our profession as some of the reasons why a Southern Dental Association is desired. The author of the article in the *American Journal of Dental Science*, which has so offended J. H. McQ., is not known to the writer and he has no interest in defending him. This article has been written solely in the interest of truth, and in no offensive sense, whatever. The writer does not mean to be offensive to any one alluded to, and has no unkind feeling to any member of the Association. He has attended five meetings of the Association, has been honored by it with office, and personally has always been treated with the utmost courtesy and consideration by his Northern brethern. He hopes to be on hand again in due time.

Nashville, Tenn. W. H. Morgan, M.D.,D.D.S.

Correction—Dr. Thomas W. Evans.—Under "Correspondence" our readers will find a letter from Dr. Thomas W. Evans of Paris, to which we invite their attention.

We are much gratified in being able to do justice to Dr. Evans, as we feel that the editorial in the Feb. number of the *Journal*, of which he justly complains, has placed him in a false position.

The paragraph which led to the preparation of the editorial in question, was translated from the French periodical known as

the *L'Art Dentaire*, and our readers will observe that Dr. Evans denies that any such proposition, as is therein ascribed to him, was ever made by him.

We at all times endeavor to do justice, and sincerely regret that the *Journal* has been betrayed into an act of injustice towards one to whom the dental profession owes so much for his untiring energy in its behalf.

White's Dentifrices and Washes.—We have received from Dr. Samuel S. White samples of the Tooth Powders, Washes, Soap and Pastes, etc., he is now preparing for the profession.

Dr. White is making more of a specialty of these articles than heretofore, and the attractive manner in which they are gotten up is an evidence of great taste. No expense has been spared in their manufacture.

The use of the many nostrums of this character at the present time, the majority of which, to say the least of them, are of doubtful utility, has led to the preparation of Dr. White's articles. He certainly deserves credit for his efforts to discourage the sale of injurious dentifrices.

Goodall's Elastic or Spring Plates.—In the Feb. number of the *Journal* an article was published from Dr. Goodall explaining his method of constructing these elastic or spring plates, and his claims for the patent.

Some practitioners, however, are disposed to doubt not only the utility of these plates indiscriminately inserted, but also the validity of the claim for their invention. The question has also been asked as to how they differ from those formerly in use constructed in the same manner. As proof that this method of inserting plates has been in use for many years, reference is made, in one of the articles published, to a paragraph in the first edition of "Richardson's Mechanical Dentistry ,1860, which reads as follows: "*Plastic or Stay Clasps.*—This form of clasp, instead of embracing the tooth, is designed to steady or fix the substitute in place by simply resting against one side of the tooth to which it is applied. They should be so connected to the plate that when pressed over the enlarged portion of the crowns of the teeth, they will spring readily into place and adapt themselves closely to the more contracted parts near the gum. In cases where there is no adequate opposing force to that exerted by the clasp, care should be taken that no more pressure is produced than is necessary to keep the substitute in place, as, without this precaution outward displacement of the teeth is liable to occur, and the appliance losing its bearing upon the teeth soon becomes loosened and insecure in the mouth. The result alluded to should be particularly guarded against in the case of young subjects whose teeth are easily moved by the application of very slight forces."

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ARTICLE I.

Review of a Lecture upon Clastic Anatomical Models.

Delivered before the Baltimore College of Dental Surgery, by F. G. Lemercier Co-operator of Dr. Auzoux and Professor of the Polytechnic Association of Paris.

The functions of nerves and ganglia are so totally different that we cannot mistake the action of either.

The nerves are for conduction only.

The ganglia are for reception—transmission—concentration and diffusion; and in a yet higher form of ganglia, we have the registering of impressions and the elaboration of these registered impressions—or the process of reasoning. Registering of the impressions by the ganglia is the 1st step and the resurrecting of these registered impressions is the 2nd step in the process;—we call this, taken as a whole, *memory*.

We would call attention here to the fact that ganglia *never originate* impressions; that some agent to act upon them through the nerves, as in the cases of common sensation and special sensations; or some agent to act directly upon the ganglia, as we believe the soul acts upon the cerebral ganglia, or cerebral hemispheres, is an absolute necessity. Light for the eye; sound for the ear; odors for the nose; sapid substances for the tongue; and in common, general or tactile sensibility, we have contact, pressure, variation of temperature &c.; upon the cerebral hemispheres some

agent must act, or else there is a break in the unity of the nervous system; that agent is the soul.

The Spinal Cord.

We are compelled to make a repetition in order that the functions of the cerebro-spinal axis, or spinal cord and brain may be studied as a whole.

The cord was shown to consist of a double series of ganglia commissured on the median line; and these ganglia were so closely packed in longitudinal series, that there was a blending of anatomical structure to such an extent that the individuality of the ganglia was lost, and they formed an extension of gray cineritious matter, continued on through the cord into the cranial cavity, and into the *intracranial* portions of the *cord*, or what we term the *Medulla Oblongata.*

This ganglionic extension was more or less central, being completely enveloped by layers of white cords or nerves, which thoroughly covered it in and concealed it from our sight.

An examination of these nerves proved that the posterior half were afferent or sensory, and the anterior half were efferent or motor; that closer examination showed that many of the nerves coming from the periphery, (*i. e.* Afferent) terminate in this ganglionic matter; and many others originating in the ganglionic matter, passed out to the periphery, (*i. e.* Efferent.)

That other nerves (probably the posterior half of the cord) were continued on to the brain, and thus carried impressions from the periphery to the central ganglia.

That the anterior half of the cord, evidently contained many nerves which had their origin in the brain or intracranial ganglia, and were the *tracts* for impressions from these ganglia to the exterior of the body, or periphery.

Now the nerves (called afferent) which begin in the periphery and terminate in the ganglionic matter of the cord, and those nerves (called efferent) which begin in this ganglionic

matter of the cord and terminate in the periphery; constitute with their special mass of ganglionic matter, *a complete nervous arc—a complete physico-reflex apparatus*, capable of acting independently of the brain. And this apparatus corresponded in anatomy and physiology with a ganglion and its nerves as seen in the ganglionic cord, of the class *articulata*. That the anterior and posterior portions of the cord, and in fact all of the cord which ran to or descends from the brain, [and was not ganglionic,] was simply commissural, and connected or commisured segments of the cord with each other, and each segment and all the segments with the intracranial ganglia.

The Functions of the Spinal Cord.

1st. Physico-reflex—In virtue of its ganglia and nerves.

2nd. Commissural.—In virtue of its nerves, (anterior and posterior.)

Comparative Anatomy teaches this; Pathology confirms it; Vivisection verifies it.

The "Magnified Encephalon" was next in order and the lecturer proceeded to dissect it, piece by piece, or ganglion by ganglion. He showed the minute anatomy of every portion, making a desultory commentary upon its supposed functions at the same time. Here however we prefer giving our own opinions, &c.

The Medulla Oblongata.

This is the intracranial portion of the spinal cord, and somewhat larger than the cord, being also more complex in its anatomy. The cord has a median fissure in front and behind, or anterior and posterior, and two lateral fissures; this gives two symmetrical halves and each half divided into three columns:—an anterior, posterior and a column between the two, or a median column.

Now the Medulla Oblongata has three lateral fissures instead of two, and therefore four columns in each half instead of three; of these four columns, the one anteriorly and the one posteriorly, lying by the anterior and posterior

median fissures, are called anterior and posterior pyramids and are exactly opposite to each other; the column next to the anterior pyramid is called the Olivary Tract or Body—the column next to the posterior pyramid is called the Restiform Tract or Body; the olivary and restiform tracts lie side by side and between the anterior and posterior pyramids.

These columns are continuous with the cord below, but their relations to the ganglia above were, and have been for many years, a vexed question.

Now if the anatomy of this model be correct, and we certainly endorse it so far as our knowledge at present extends, then we would say that Drs. Auzoux and Lemercier have contributed a most exquisitely beautiful, and a most admirably adapted specimen for the study of the Encephalon and its ganglia.

We shall endeavor to give concisely this anatomy and then give the functions of these ganglia. Posteriorly the two pyramids, wheel right and left out of position and leave a triangular space called the *Calamus Scriptorus;* the Restiform bodies by about one ,half of their columns, reinforce these wheeling columns from the pyramids, and the two blend as one and immediately form one of the " crura cerebelli," and run into the lateral hemispheres of the cerebellum; anteriorly, the anterior pyramids send a winding band around the olivary body and over this body, which under the name of " arciform fibres," winding back, seeks the crura cerebelli and blends with them upon each side; each crura cerebelli has therefore fibres from 1st. Posterior Pyramids—2nd. Restiform tract—3rd. Anterior Pyramids; it contains therefore both motor and sensory elements.

Now there remains to be accounted for—1st. part of the Restiform—2nd. Olivary tract, and 3rd. the remainder of the anterior Pyramids; these run beneath the broad transverse band of white fibres known as the Pons Varolii, and emerging beyond form the diverging " crura cerebri."

Now the cerebellum is built up, as it were, upon the crura cerebelli; the broad band of white fibres stretching

across the front of the "crura cerebri" at their origin, runs into the right and left hemispheres of the cerebellum, and terminates in a rounded constricted cord; now these constricted terminations of the "Pons Varolii" are called also "crura cerebelli." So far, we have two sets of crura cerebelli.

4th Ventricle.

As the posterior pyramids have wheeled out right and left and turned upwards to form the "crura cerebelli," and as about one-half of the restiform column has joined in this movement out, there must arise two things; 1st, the triangle, or calamus scriptorus; 2nd, the uncovered central ganglionic matter of the cord comes into view lying upon this triangular space, now also, as only one-half of the restiform tract wheels out to become "crura cerebelli," and as the other one-half passes on forward to become "crura cerebri," and converges towards its fellow opposite, we have necessarily a lozenge shaped space; formed by the diverging pyramids below and the converging halves of the restiform above.

This space is beneath the cerebellum;—behind and resting upon the posterior aspects of the anterior pyramids and olivary bodies, and between the diverging posterior pyramids and the converging halves of the restiform tracts above; this is the 4th ventricle; and upon its floor the ganglionic matter comes into view, and here the 8th pair of nerves, according to Soemmering, have their ganglia and their origin; in the Carp, a species of fish, the auditory ganglia is a distinct ganglion upon the floor of the 4th ventricle. The half (upon each side) of the restiform body which runs up and blends with "crura cerebri," terminates partially in the "testis" of that side, and hence has been called "processus e cerebello ad testes"; the halves approximate but do not unite along their entire depth and a small bridge of nervous matter is thrown between them; this of course covers up the space and makes a canal, this canal is called the "aqueduct of Sylvius;" or "iter e tertio ad quartum ventriculum."

The Tubercula Quadrigemina, called also the Nates and Testes, rest upon this bridge and upon the lateral restiform tracts: but here the restiform tract has lost its name, and assumed that of the *posterior surface of the crura cerebri*, hence the Tubercula Quadrigemina are said to be situated upon the posterior surface of the crura cerebri, and above the aqueduct of Sylvius.

The Crura Cerebri.

Have an anterior or motor portion derived from the anterior pyramids and olivary bodies, and posterior derived from the restiform, or from that half of the restiform which did not go up into the cerebellum and become " crura cerebelli;" this posterior portion has fibres which come from the cerebellum intrinsically, and therefore, though the restiform gave a portion of itself to the cerebellum, that organ returned the gift in a series of fibres that help to make up the " processus e cerebello ad testes."

Now the question arises what becomes of the Crura Cerebri?

These crura ascending, diverge somewhat and terminate abruptly in two large ganglia; the posterior portions in the Optic Thalami and the anterior portions in the Corpora Striata. These ganglia lie upon the floor of the lateral ventricles;—optic thalami parallel and not in contact, having an open space called the 3rd ventricle between them; the corpora striata, anterior to the optic thalami, are not parallel but convergent and pyriform, the larger ends meeting on the median line; the smaller ends divergent and permitting the optic thalami to come up between them. The optic thalami receives the sensory and the corpora striata receives the motor tract.

The model of Dr. Lemercier showed all of this, but it showed more;— it showed that the fibres which ran into the optic thalami *terminated in it*; and other fibres took their *origin* in the optic thalami and diverging widely as they emerged, were distributed in every direction ascending

towards the superficies of the hemispheres, or towards the cerebral ganglia and *terminated in the gray convolutions of these ganglia.* Again, that many other fibres *began* in these *gray convolutions*, in every part of these hemispheres, converging descended and passed into the *corpora striata* and there *terminated*; that other fibres *began* in the *corpora striata* and ran down as the anterior columns or motor tract of the crura cerebri, and of the spinal cord.

In the statement of the facts as they really exist we should say that, the posterior portions of the "crura cerebri," run into the optic thalami and stop, for these are their proper ganglia; that fibres arise in the optic thalami and run out towards the the cerebral convolutions and terminate in these convolutions; that fibres begin in these convolutions and run converging down to the corpora striata and there terminate; and that fibres begin in the corpora striata and running down become the anterior portions of crura cerebri and cord.

Now it will be seen, that, as the anterior or motor tract is *descending* from the encephalon, the statement made about the "arciform fibres" coming from the medulla oblongata and running into the crura cerebelli and finally into the cerebellum, must be exactly reversed; these arciform fibres begin in the cerebellum and passing down converge into narrow cords on the crura cerebelli, and winding around the olivary body they descend blended with the anterior, and seek a terminal distribution with the anterior or motor tract of the cord.

Mr Solly of England (in his admirable work upon the Structure, Physiology and Diseases of the Brain, pages 188, 189, 190) teaches that these fibres descending from the cerebellum to join the medullary oblongata, are composed of three or four distinct sets, superficial and deep, and thinks that they form a very large element of the descending motor tract of the cord.

Certainly the physiology of the cerebellum requires exactly this anatomical arrangement; and we cordially endorse Mr. Solly; and Dr. Lemercier's illustration of Solly's

and Magendie's views, throws a flood of light upon this organ as well as upon the cerebrum and other ganglia.

The Functions of the Cranial Ganglia.

The Medulla Oblongata being the intra cranial portion of the " spinal cord " has the two functions of the cord, that is physico-reflex action and commissural action; and we find many sensory and motor cranial nerves arising from it, as the 3rd. 4th. 5th. 6th. and 7th. pairs, and also the 9th. 10th. and 12th. pairs; but it has also some special ganglia which pre- over special functions as

1st. The ganglia of the Olivary body—for Deglutition.

2nd. The ganglia of the Restiform—for Respiration.

Pons Varolii

Is a commissure for the two cerebellar hemispheres and contains a ganglion called " tuber annulare," which is thought to be connected with semi-consciousness and semi-volition, but this is not as yet demonstrated as true.

Cerebellum

Is for (1) Muscular co-ordination. (2) Muscular Sense. By muscular sense we mean the faculty of interrogating the muscular system and ascertaining its exact condition and the exact amount of force which we can elicit for any given purpose; by muscular co-ordination we mean the combining and directing of the action of many muscles to the attaining of one end,—one common definite result. Muscular co-ordination means *concentrated unity* of action.

There are many able men, (as Trousseau of Paris for example) who do not comprehend or do not believe in the existence of this " Muscular Sense;" they ask, how will you distinguish it from " Muscular Co-ordination ?"

The distinction to us is an obvious and an easy one, and can be illustrated very readily

The "*Inspector* " of a division in an army has nothing to do with the movements of troops; his duty is to ascertain the " *exact fighting* " condition of every company, regiment,

and brigade— he reports this information to the proper officer (Division Commander), and upon his report, this officer *acts*, knowing exactly how much fighting power he can wield ; now suppose the action to begin, we will at once see him co-ordinating the movements of the brigades; unitizing their different actions for one result, and avoiding in every possible way irregular and desultory action,—here the one head commanding co-ordinates the efforts of severalbrigades into one common effort of the division, and, if he does his duty, he obtains "*unity of action—unity of result.*"

The *Inspector* corresponds to the muscular sense. The *Division Commander* to the co-ordinate power. The muscular sense deals with the muscular system in its passive state; the co-ordination deals with it in its active state.

A close examination of this model, showed a general commissuring or interchange of fibres between the different cranial ganglia. The optic ganglia, called Tubercular Quadrigemina, were commissured with the cerebellum and cerebrum; the cerebral hemispheres or cerebral ganglia were commissured with each other by the great transverse commissure, the Corpus Calosum and the Fornix blended; and by the crura cerebri were commissured with all ganglia below them; *but*, and here comes in a remarkably nice point, only through the "optic thalami."

"All roads lead to Rome," all Sensory nerves lead directly or indirectly to the optic thalami; afferent nerves (called sensory) may terminate in the ganglia of the cord, but unless the impressions conveyed to the cord are transmitted to the brain and become sensations, these nerves are not sensory; they are afferent and physico-reflex only.

All sensory nerves end either in special ganglia, or end in the optic thalami; and those ending in special ganglia, as the auditory, optic, &c., are commissured with the optic thalami, by cords from ganglia to ganglia. All motor nerves *begin* in the corpora striata, except the arciform fibres *descending* from the cerebellum.

From the anatomy of the optic thalami and the corpora

striata, we perceive that they bear a relation to each other exactly parallel with that of the posterior and anterior gray horns of the cineritious, or ganglionic matter of the cord, *i.e.* sensation and motion.

The Optic Thalami.

These are the last *grand registering and receiving depots;* they are the *common centres* of all impressions; they receive and register all sensations, special or general.

Now the fibres radiating out from these ganglia towards the superficies of the brain, must be divided into two classes, 1st, those conveying to the cerebral ganglia information of what has been registered; 2nd, those fibres through which the *will* acts in resurrecting or bringing out these impressions, in the process of "re-collection;" and this word *recollection* is most appropriate and most happily true. Memory is but the effort by which we collect again, or re-collect these impressions registered in the optic thalami.

All impressions are here received and stored up, registered,—they remain as long as life lasts, each one modifying every other and being itself modified by what has gone before and by that which comes after. It is true then that "first impressions are lasting"? yes, and also modifying and controlling for good or evil.

The Corpora Striata.

Great Motorial Centres—and all impressions descending from the brain,— that is from the cerebral ganglia, and having for their object voluntary muscular action, must pass into the Corpora Striata; and from these descends the proper motor influence. The "motor influence" does not descend really from the cerebral ganglia, but an order, as it were, is transmitted to the corpora striata and these ganglia send out the "*motor impulse*." The corpora striata under orders from the cerebral ganglia, evolve motor impulses.

Sensori-reflex.

These acts are performed often involuntarily though consciously, we are conscious of the sensation, *i.e.* the registered

impression, but the will does not act to evolve the motor impulse, only the optic thalami and corpora striata act, the cerebral ganglia are quiescent.

Cerebral Ganglia.

Seat of the Intellect;—the Ganglia of Soul; the intelligence and powers of acquisition being almost directly as the number, size, weight and complexity of the convolutions. We believe the cerebral ganglia to be the *material instrument* of the *immaterial agent* or essence which is called the *Soul.*

It has been impossible to do justice to this lecture by mere statements, the models were everything as regards clearness and interest. We have omitted a good deal and will conclude with a statement of ganglia and functions, as far as our present knowledge extends.

Intra Cranial Ganglia.

(1) Ganglia of the olivary bodies—Lingual and Deglutition. (2) Ganglia of the Restiform—Respiration. (3) Ganglia of the 4th Ventricle—Auditory. (4)Ganglia of the Pons Varolii—Semi-consciousness. (5) Ganglia of the Cerebellum —Co-ordination and Muscular Sense. (6) Ganglia of the Crura Cerebri—Oculo motor. (7) Corpora Quadrigemina —Optic Ganglia, vision. (8) Optic Thalami—Touch, common Sensibility and Grand Register. (9) Corpora Striata —General Motor. (10) Olfactory Bulbs—Sense of Smell. (11) Cerebral Hemispheres—Seats of the Intellect.

The study of the anatomy of the nervous system by these models from comparative anatomy and the magnified encephalon, presents one of the most beautiful and most instructive fields open to the investigation of the student. The accuracy of anatomical details, the variety of the models, and the skill with which the series have been arranged, should command the highest praise and most grateful acknowledgements from the profession generally.

ARTICLE. II.

*Insanity Cured by the Removal of Carious Teeth.**

By W. T. PERRY, M. D., of Maury Co., Tenn.

In compliance with promise and inclination, I submit for your disposal such facts as I have in reference to the following case, which came under my professional care and observation a few months previous to the recovery of the patient.

Mrs. B., aged 35, of nervous sanguine temperament and good physical strength and form, has been married twice but has never borne children, and is now living with her surviving husband who resided in an adjoining state at the time of the first occurrence of insanity with his wife. From him I learn that her general health previous to attack had ordinarily been good, with the exception of occasional slight attacks of menorrhagia. She has also suffered more or less with indigestion, which at times became troublesome in its effects, being followed by colic, neuralgic affections and occasional afflictive spells of odontalgia, the result probably of decaying teeth.

In her general mental and moral characteristics, she was a gentle, kind, religious lady of good social qualities, pleasant and affable, and much loved and esteemed by her acquaintances, but! how changed the scene! how altered the mental and moral characteristics of this amiable lady when "reason was dethroned," and the beauty and symmetry of a well regulated mental and moral constitution was spoiled by this grave mysterious affection. This disease first made its appearance in the form of slight mental aberations, evinced by her lavish kindness in giving away her clothing and other property to the amount of nearly all she had. This was soon succeeded by an exaltation of the cerebral functions with increased perversion amounting to *Raving*

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* For this interesting case we are indebted to Dr. J. R. Ralston of Hopeville P.O. Tenn., for whom it was described by Dr. Perry. Dr. Ralston writes as follows:

"Dr. Gorgas:—All the parties mentioned in this article are well known to myself. I have known them all my life, with the exception of Dr. Perry, whom I have known for several years. He is a pious and truthful man. If you think best you can publish Dr Perry's letter in the *American Journal of Dental Science*. The circumstances as stated are well known to every person in this county."

J. R. RALSTON.

Mania, which became so persistent and violent as to render seclusion and confinement necessary. She was accordingly taken to an *asylum for the insane* for treatment, at which place she remained for nearly two years, realizing no decided improvement or change in her mental lesion.

Her case being considered by her husband and friends as confirmed and unpromising of favorable results, she was removed to this community, and kept in close confinement on account of paroxysmal boisterous, destructive disposition. It was under these latter circumstances that I learned she was afflicted with sore and swelled gums, and at times suffered much with neuralgia involving the the teeth, face and contiguous parts. Observing that she had quite a number of decayed teeth and unremoved fangs of teeth, I suggested their removal by extraction as a means of alleviating her sufferings and possibly mitigating her mental disease. This was accordingly done by removing a portion at a time at intervals of a week or more (just as we could prevail upon our patient to submit), which was soon followed by decided and marked improvement, both with reference to sufferings and mental disease, and finally with perfect and complete recovery.

She now attends in person to her household and domestic affairs, and for the past six months, up to this writing, has remained free from insanity.

I consider the case one of recovery after having been continuously insane for three years, and that the result of recovery was effected by the removal of carious and defective teeth, as no other remedy of a special character was used at the time.

ARTICLE III.

Osseous Growths in the Gums.

By Dr. Thruston Wolfe.

The first case which came under my observation was that of a colored girl, fifteen years of age, who applied to me for

the purpose of having (what she believed to be) a tooth extracted.

On examining her mouth I found all of her teeth perfectly sound and the gums in a healthy condition. But between the inferior right second bicuspid and the first molar, I discovered an osseous growth on the lingual surface of the gum below the necks of the teeth. By means of an elevator I dislodged it without difficulty, as it appeared to be connected with a cartilaginous substance, and not with the bone. Very little hæmorrhage followed its removal, and the pain of the operation was but slight.

In size this osseous growth was nearly half an inch long and a quarter of an inch wide. A careful examination (without a microscope however) convinced me that it was a true osseous growth.

The second case I met with was that of a little girl between nine and ten years old. The tumor in this case was situated between the superior right second bicuspid and the first molar, on the palatine surface of the gum, having an irregular shape and extending down between the teeth named as far as their buccal surfaces.

I removed this growth in the same manner as the first, and with the same results.

The third case was that of a lady aged about forty-five years, who complained that something in her mouth had been annoying her for years. On examining her mouth I found precisely the same kind of a growth as in the second case I have mentioned, except that it was situated between the superior second and third molars, far up on the palatine surface of the gum.

I removed this growth also, and it appeared to have only a fleshy connection. Very little pain and but slight hæmorrhage followed its removal.

In all of the cases I have described the gums presented a perfectly healthy appearance, and the teeth were free from salivary calculus. Before removing the osseous growth in the second case I have mentioned, I called in a physician to

examine it, and he pronounced it to be a protrusion of the alveolar process, but remarked that he had never seen anything like it before.

They were all certainly true osseous growths and neither teeth nor roots of teeth, as I examined them very carefully to discover whether they were of the class known as "supernumerary."

Remarks.—The three cases above described are of considerable interest, as Dr. Wolfe is satisfied from careful examinations that these growths were truly osseous in their nature, and neither supernumerary teeth nor roots of teeth imbedded in the gums.

What are known as "dentigerous cysts" are occasionally met with, and may occur in either jaw, but as these are always connected with the roots of fully developed teeth or with imperfectly developed teeth, and arise in connection with teeth which have from some cause remained within the jaw, or inverted teeth giving rise to more or less irritation, the cases under consideration were clearly not of this character. Besides, dentigerous cysts are connected with the maxillary bones, being inserted between the two plates of the bone, and contain a serous glairy fluid, often invading the antrum, when in the upper jaw, by absorption of the bony wall.

We think, therefore, that these cases may be properly classed under the term "epulis", as the abnormal growths of the gums known by this name vary in their nature.

Ordinarily, epulis consists of a firm fibrous tumor in which we sometimes find fibro-plastic cells, and, occasionally, a development of true osseous matter. A case is mentioned by Christopher Heath, F. R. C. S., where he removed a large epulis from the upper jaw of a young woman, in which a nodule of bone of a large size was developed near the surface of the gum and quite unconnected with the alveolus.

The surfaces of these tumors are often covered by perfectly healthy mucous membrane which is stretched over them, and, although they may have no immediate connection with

the teeth, are probably caused by some irritation proceeding from these organs. Their growth is also slow, and the patient is only aware of their existence by the deformity they occasion. [Ed.]

ARTICLE IV.

Restoration of the Jaw.

By Dr. J. D. Patterson, of Lawrence, Kansas.

The patient, Major J E. Montandon, of Oskaloosa Kansas, had an operation performed for necrosis of the left superior maxilla, the whole of the maxilla being removed from the right central incisor, also part of the hard palate as the model sent will show.

The operation was performed by the late Dr. Mussey of Cincinnati, Ohio, some eighteen years since, and was extensively noticed at the time by the medical news of the day. After such an operation considerable deformity of course existed, rendering the substitution of an artificial part very desirable; and notwithstanding the fact that many operators had failed, I advised that the operation of substitution was practicable.

Some dentists had advised the severing of the masseter muscle, that being the chief obstacle to a successful operation. against this, however, Dr. Mussey protested and told the patient rather to remain without a plate. I took the impression with plaster, shaping a common cup with wax to suit the case, and, after considerable difficulty, succeeded in obtaining a correct impression of the parts. I removed the plaster as soon as it was hard enough to retain the form, on account of the remaining teeth on the right side permitting the plaster to break, and afterwards united the pieces. I of course made the plate of vulcanite, supplying the artificial jaw with teeth, clasping the only right bicuspid and the central incisor with well fitting gold clasps; the method of procedure I suppose is well known to all practitioners. I also permitted a rubber band around the wisdom tooth, deeming that clasping three teeth instead of one would relieve any strain on the clasped teeth.

I also used a moderate sized air-chamber. The result is in all respects entirely satisfactory, the plate fitting well and firmly restoring the contour of the face, assisting very materially in speech, and as the lower teeth are quite good it improves mastication greatly. Were it not for the drooping of the lip on the left side on account of the attachment of the Superior-alæque-nasi muscle being gone, the face would appear quite natural. I am now satisfied that the plate can after a time be worn without clasps—removing the only objectionable feature.

The patient, who is a gentleman of culture, is highly pleased with the appliance, and finds after a month's trial that not the least inconvenience is experienced from it.

ARTICLE V.

Notes from Dental Practice.

Disease of the Antrum. History and Nature of Case.—Patient a resident of North Carolina, aged 38 years, of a nervous temperament, and, though inclined to be fleshy, possessing an impaired constitution. He gives the following history of his case: "About the middle of July last, I became overheated during the day and the weather being extremely warm at night, I threw a quilt upon the floor of the piazza and fell asleep having no other clothes on except a shirt and pants, which were wet with perspiration. Upon awakening I found myself almost frozen, and the next day was afflicted with a heavy, dull headache, and all the symptoms of a severe cold. At the end of two weeks the discharge from the nose ceased, but this cessation was followed by a fever, periodical in its character, which continued for a week when the pain in my head increased to such a degree as to almost cause delirium.

My family physician was called in and relief was obtained in a day or two, the pain in my head becoming much less severe, but the fever continued for a month longer resisting all remedies which were administered to check it.

I had for some time suffered from bad teeth and old roots,

one of which was extracted, and for this reason my physician requested me to apply to the dentist, which I did. Dr. T., the dentist, upon examining my mouth pronounced my disease to be suppuration of the lining membrane of the antrum. He extracted all of the diseased teeth and roots, and made a hole through the bone of the jaw into the antrum, using for this purpose the cavity of the third tooth back of the eye-tooth; through this opening a good deal of water mixed with blood escaped. The Doctor then syringed the cavity through this opening twice a day with water, washing matter out of the nostril of the affected side, which gave me some relief, after which he injected rose water. At the end of a week from the time the water was first injected, recourse was had to sulphate of zinc, 6 grs. to the ounce of water, which was thrown into the cavity once a day.

As this preparation did not appear to have the desired effect, an application of nitrate of silver 1 gr. to the ounce of water, was injected, but after using one ounce of this preparation, it caused me so much pain that I discontinued it. Something has of late made it appearance in my nose, obstructing the free passage, which on being removed was pronounced by Dr. T. to be "polypus," but as it has not returned may have been thick mucous matter. On syringing the antrum there appears to be at times some little flocculent substance blown about by the injection near the hole which leads from the antrum into the nostril. I am at times better, then worse, and my last attack has been the most severe; for six weeks past I have been confined to the bed for more than half the time, but at present I can walk about for some hours every morning.

My forehead and eyes are somewhat swollen, my right eye almost shut; this eye, before my last attack had not been affected, as the disease was confined to the left side of my head and the left eye. I have been subject to pains in the diseased left eye for a good many years, called "sun-pain," which quinine would generally relieve, and I have used quinine this time with benefit. My hands and feet are cold

when I am in much pain, but as soon as I get into a perspiration I experience relief. When syringing the cavity, if I do not place the end of the nozzle of the syringe in the direction of the opening of the cavity into the nose, I can get but little if any matter out. It was one month from the time I was first taken before the discharge of matter commenced about the root of one of the teeth I had extracted, which was soon followed by the discharge from the nostril of the same side; it now runs into my mouth from the opening made into the antrum, and when it is very thin I cannot prevent its running down my throat and causing great nausea.

It has never discharged much from the nostril of the side first said to be diseased, since the operation upon that side. On the sixth of November I was seized with a chill which was followed by fever, and then the right nostril discharged bloody matter; since that time the right nostril has been constantly discharging, and the left one none of any consequence."

Treatment.—From the above description of this case, and without having seen the patient, we conclude that the affection of which he is suffering is either scrofulous, syphilitic or cancerous. The discharge being now from the right nostril is evidence that the bones of the nose are diseased, and the swelling and pain in the eyes and forehead that the disease has invaded the frontal sinuses.

The following treatment is thereforere commended: Injection into the antrum of either Lugol's solution or the permanganate of potash; inhalation of iodine once or twice a day; tincture of iodine externally applied; and of the syrup of the iodide of iron gtt. x, iodide of potass. gr.viij, cod liver oil a dessert spoonful, this prescription to be taken three times a day. In addition to the above, benefit may also be derived from some bitter tonic, such as tincture of cinchonæ or tincture of gentian, half an hour before each meal.

CORRESPONDENCE.

ARTICLE VI.

Baltimore, May 6th, 1869.

Mr. Editor:—

At the last meeting of the Baltimore Pathological Society, Dr. H. R. Noel exhibited to the Society a human monstrosity. The specimen was that of a double headed mulatto child, having four arms, one body and one pair of lower limbs. The heads were well formed, and the necks and shoulders were normal, but the bodies coalesced immediately below shoulders and clavicles, the two sterni running into one, and the body down to the feet being single and of the natural size.

This rare specimen was from Mathews Co., Va., and a third child born at the same time was alive and doing well as were also both father and mother. Dr. Fitzhugh of Mathews Co. owns the specimen, and wishing to dispose of it, sent it to Baltimore and placed it under the care of Mr. Chas. Snead, of the firm of Thomas Norris & Son, opposite the Maltby House upon Pratt St.

Through the extreme kindness of Dr. W. E. Norris and the courtesy of Mr. Chas. Snead, Dr. Noel was made aware of the existence of this specimen and enabled to exhibit it before the Society. Mr. Snead thinks that it was born alive and cried some hours before it died.

ARTICLE VII.

American Dental Association.

Mr. Editor:—Permit me to call the attention of the delegates to and members of the Dental Association, which holds its annual meeting at Saratoga on the first Tuesday in August, to the desire intimated and expressed by some, of making our next meeting additionally attractive and interesting, by combining the social elements with our professional gathering, and to this end the committee of arrangements would suggest and urge the delegates and members

to bring their wives and daughters with them, in the hopes that by so doing additional interest will cluster around our gathering, and add much to the pleasure and gratification to ourselves and those connected with us.

The committee will see that accomodations are provided for all who will give timely notice of their wishes by addressing the chairman, stating what accomodations they require.

J. G. Ambler, Chairman.
25 W. 23d Street, N. Y.

ARTICLE VIII.

Tennessee State Dental Association.

The time and place of the Third Annual Meeting of the Tennessee State Dental Association having been changed from Lookout Mountain, will convene at Nashville on Thursday, July 22, 1868.

Any contributions in the way of original Essays upon Medical or Dental Science will be thankfully received by the Association.

Wm. M. R. Johns, Secretary,
Sommerville.

Wm. T. Arrington, President,
Memphis.

SELECTED ARTICLES.

ARTICLE IX.

*Anæsthetics and their Administration.**

By D. H. Goodwillie, M.D., D.D.S.

It has been well said that "the discovery of anæsthesia, like many others in science and art, was the result of long-continued and patient effort made by many persons—not by accident, but carried on for years with the definite end in view which was afterwards attained.

" This discovery was thankfully received by suffering hu-

*Read before the New York Medical Association, Jan. 15th. 1869.

manity; but by the surgeon, particularly, it received a hearty welcome, as his operations were aided, his usefulness extended and his feelings of humanity spared.

"Although there were shadows that seemed to darken the lustre of this discovery, yet it only appeared to stimulate inquiry, and the result has been a better acquaintance with the agents employed, clearer views of the sources of danger, and more certain rules for safety in their demonstrations."

The Egyptians used many drugs to relieve pain, or assuage grief—to produce intoxication or ecstacy. In the time of the Roman empire, means were employed to mitigate pain in surgical operations.

Pliny and Dioscorides described some medicament for relief of pain. The Chinese surgeons and ancient Scythians inhaled narcotic vapors. The Indians threw tobacco on their camp-fires, to put them in a state of ecstacy.

Even among civilized nations such were used. The priestesses at Delphi became intoxicated by the fumes of narcotic plants before delivering the oracles. May this not have been the germ from which has sprung surgical anæsthesia? Albertus Magnus (thirteenth century) probably knew something of the use of ether as an anæsthetic, for he gives a recipe for its preparation. In the sixteenth century, Porat, of Naples, mentions a soporific medicine.

The anæsthetic effect of nitrous oxide was suggested by Sir Humphrey Davy, in 1776, as seen by the following extract from his work: "As nitrous oxide in its extensive operations appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." This idea of Davy's found a practical demonstrator in the person of Dr. Horace Wells, to whom, without doubt, belongs that honor. The successful trial of surgical anæsthesia occurred several years before Jackson proposed, or Morton used ether. That the brain of Horace Wells was the modern scource and origin of anæsthesia has been fully established.

An anæsthetic is a substance capable of abolishing the function of sensation. True anæsthetics are local anæsthetics, because capable of depriving it of sensation only. In general anæsthetics there is loss of motion, perception, thought, conciousness, etc.

List of Anæsthetics.

NAME.	SYMBOL.	PROPERTIES.	Boiling point. Fahr.	Gas or vapor. Density H=i.
Nitrous oxide gas..................	NO.	Supports combustion....	......	22
Carbonic oxide gas................	CO.	Burns in oxygen....	......	14
Carbonic acid gas.................	CO_2	Prevents combustion....	......	22
Light carburetted hydrogen gas.. / Hydrate of methyl or marsh gas..	CH_4.	Burns in air...............	......	.8
Methylic alcohol..................	CH_4O	Vapor burns in air......	151	16
Methylic ether gas....	$(CH_3)_2O$	Burns in air.........	......	23
Chloride of methyl gas............	CH_3Cl	............do....	......	25.25
Bichloride of methylene...........	CH_2Cl_2	............do............	88	42.5
Terchloride of formyl (chloroform)	C_2HCl_3	Vapor extinguishes flame	142	59.75
Tetrachloride of carbon...........	CCl_4	............do............	172	77
Heavy carburetted hydrogen gas / Olefiant gas or ethylene..........	C_2H_4	Burns in air...............	......	14
Ethylic alcohol (absolute alcohol)..	C_2H_6O	Vapor burns in air.......	172	23
Ethylic ether (oxide of ethyl, sulphuric ether).................	C_4H_5O	............do............	96	
Chloride of ethyl..................	C_2H_5Cl	............do....	52	32.25
Bichloride of ethylene (Dutch liquid)	$C_2H_4Cl_2$	............do	175	49.5
Ametic alcohol (fusil oil)..........	$C_5H_{12}O$	............dd............	270	44
Hydride of amyl..................	C_5H_{12}	............do............	86	36
Amylene..........................	C_5H_{10}	............do............	90	35
Hydrate of caproyl (light pet. spirit)	C_6H_{14}	............do............	154	43
Benzol............................	C_6H_6	............do............	180	39
Turpentine spirit..................	$C_{10}H_{16}$	....	320	68

Compound Anæsthetics.

Chloride of methyl in ether—Chloride of methyl in chloroform.

Among the many anæsthetics, I propose to take up only those in general use, viz.: chloroform, ether, bichloride of methylene, and tetrachloride of carbon.

CHEMISTRY OF CHLORFORM.

It is a colorless liquid. Aromatic and penetrating smell—taste sweetish—sp. gr. 1.491, chem. formula C_2 HCl_2 or 12 parts carbon, 1 part hydrogen, 105 parts chlorine. It is made by the distillation of rectified spirits with water and chloride of lime—the addition of quicklime renders the product more abundant and pure. It should be purified by washing with water, then shaken with a solution of carbonate of soda, and then redistilled.

The adulterations of chloroform are:

I. Alcohol or ether, which reduces its strength.

II. Methyl compounds.

III. Product of decomposition.

A ready test for alcohol is to drop some chloroform in distilled water. If pure, the globules of chloroform will sink to the bottom and preserve their transparency; if alcohol be present, they will have a milky appearance. The test for ether is the same as alcohol, by the smell.

Test for methyl compounds is strong sulphuric acid; becomes black when mixed with chloroform. Time, air, and light, produce a variety of changes in chloroform by the formation of certain hydrochloro-carbons, hydrochloric acid and free chlorine. Free chlorine may be detected by adding a little chloroform to distilled water, and then add a little solution of nitrate of silver; if chlorine is present, a white precipitate will be formed.

Chloroform evaporates at all temperatures. Air at 40° Fahr. can retain 6 per cent. of chloroform vapor. Air at 60° Fahr. 12 per cent. This fact ought not to be forgotten in the administration.

CHEMISTRY OF ETHER.

Ether, chemical formula $C_4\ H_5\ O$, or by weight, 24 parts carbon, 5 parts hydrogen, and 8 parts oxygen.

Prepared by distilling equal parts of alcohol and sulphuric acid. A colorless and limpid liquid, of peculiar odor and hot taste, specific gravity, at 60° Fahr., .720, boils at 96° Fahr. With oxygen or atmospheric air it forms an explosive mixture, and kept in contact with air, produces acetic acid. Dissolves in alcohol in all proportions, and is often diluted with it; purified by water, which unites with it. Chloroform compared with ether is much more powerful.

Dr. E. R. Squibb gives the following test for ether: Half fluid ounce of the stronger ether, evaporated spontaneously from a breakfast-plate, should give, as the last portions pass off, only a faint aromatic odor of light oil of wine, and

should leave an odorless, tasteless residue upon the surface of the plate. When shaken in a test tube with an equal volume of water, it should lose 10 per cent. of its volume. In a test-tube half filled and grasped in the hand for a short time, it should boil actively upon the addition of small fragments of broken glass.

CHARACTER OF BICHLORIDE OF METHYLENE. (CH_2Cl_2)

(By weight, C. 6 parts, $H_2Cl.$, 70.)

1. It is an effective general anæsthetic, producing as deep insensibility as chloroform.

2. In action it is rather more rapid than chloroform, but, to develop effects more of it is required, in the proportion of six parts to four.

3. It produces in the second degree, less prolonged narcotism than other anæsthetics.

4. When effects are developed fully, the narcotism is very prolonged.

5. Its influence on the nervous centres is uniform, and it creates little, if any disturbance, or break of action between the respiration and circulating functions.

6. Its final escape from the organism is rapid; symptoms of recovery are sudden.

7. In some cases it produces vomiting.

8. When it kills, it destroys by equally paralyzing the respiring and circulating functions.

9. It interferes less with the muscular irritability than perhaps any other anæsthetic.

10. It combines with ether and chloroform in all proportions.

I have used this agent several times, and find that it accords with the above character, and trust it may always prove so.

It will be seen that the only difference between the bichloride of methylene and chloroform is, that it has one atom more of hydrogen, and one less of chlorine and carbon.

TETRACHLORIDE OF CARBON. (CCl_4)

(By weight, 6 parts, C. and 140 Cl.)

It has a pleasant odor, somewhat resembling that of quinces.

Anæsthesia is rapidly produced by it, and easily sustained with or without entire loss of consciousness, and the effects pass off very quickly.

Not usually any excitement or struggling before anæsthesia supervenes, or followed by any sickness.

It possesses a great point of interest in immediately allaying pain from any cause, headache, dysmenorrhœa, suffering, etc. It is said to be valuable in inducing quiet and refreshing sleep.

In midwifery it removes pain without necessarily destroying consciousness, or interfering apparently with the expulsive efforts of labor.

Having had but little experience with this agent as an anæsthetic, I cannot therefore pass judgement on it. I am not, however, thus far very strongly biassed in its favor.

The effects of inhalation of these anæsthetics are both local and general. On a sensitive surface it acts as a caustic. The irritation of the air-passages is due to this fact; thus we have the spasm manifested by coughing, etc. When the narcotic effect is produced, the spasm is controlled. Irritation is changed for partial paralysis.

The physiological action of these anesthetics is to produce I. A stimulus—an excitation of the functions. II. A suppression—a retardation of the functions. Small quantities, diluted with air, prolong the former—large quantities suddenly collapse the functions. The power over muscular motion is unequal, but abrogation of sensation is common to all. The mental processes are less affected by nitrous oxide.

Circumstances modify the action these agents may have upon the system. Diffusibility, volatility, solubility, all influence their effects.

While water can hold in solution one-ninth of its weight of ether, it dissolves only $\frac{1}{280}$ of chloroform.

We see from this that the quantity *inhaled* is *not* the quantity *absorbed*. All these agents act by absorption into the blood, whether taken into the lungs or stomach, or injected under the skin. Here, let me remark, is opened up a wide field of research. Gases (N.O., for instance) are readily absorbed and easily eliminated. Vapors are much less so. Elimination is accomplished in less time, if the anæsthetic agent is taken into the lungs, than in any other way, as the blood is not so heavily loaded.

When a quantity of vapor or gas is breathed, it is brought into contact with six hundred millions of air cells of the human lungs, the superficial extent of which, as estimated by Linderman, is not less than 2,642 square feet. In inducing anæsthesia, fifteen or 20 cubic inches of the anæsthetic mixture, fifty or sixty times over, are brought into contact with this surface, and manifest their effects by direct action on the central parts of the nervous system, through the medium of the blood; or they may act on the blood, modifying that interchange of elements necessary to perfect health; or in other words, that narcosis is suspension of oxygenation.

ACTION OF ANÆSTHETICS ON THE BLOOD.

Ether gives the blood a dark-blue color, prevents rearterialization, and dissolves the blood-corpuscles setting free the hematin.

Chloroform turns the blood a brilliant scarlet color; does not dissolve the blood-corpuscles, as ether, but destroys a greater number of them, setting free the hematin and crystallizing it.

Dr. Geo. Harley says: "The common property of all narcotics and anæsthetics is to diminish the energy of interchange between the constituents of the air on the one hand and the blood on the other."

Causes of difference in color of blood are due less to change of composition than to change of form. Distending the corpuscles darkens the blood, making them more convex; when concave, it brightens the blood.

The first general effects on the organism, of the anæsthetics, when inhaled, are stimulant. As soon as the narcotic begins, the senses become affected; and, about the time sensation is lost, there occurs a muscular tremor. This indicates the severance from the central nervous power; the muscles, which are now left to their own individual influence—heat, electricity, etc.—begin to relax for a want of coördinating power. Coördination, being a compound of sensation and motion, is perfect only when the nerve-fibres are in equal degree capable of transmitting impressions from the centres.

When muscular tremor subsides, the patient is in a state of complete insensibility, having the appearance of sleep: the pupil of the eye somewhat contracted; pulse beating rather slow; the breathing regular; begins to snore a little.

There is now a very delicate balance in the organism, in this state of induced anæsthesia. Dr. Sansom says of it: "On the one side, is Being robbed of many of its attributes; on the other side, is death. Compensating oxygenation maintains the one, while insufficient oxygenation induces the other."

Dr. Sansom divides narcotism into three stages, viz.: 1. Perversion of consciousness; 2. Abolition of consciousness; Muscular relaxation. Or, in other words: 1. Sopor; 2. Stupor; 3. Stertor.

Narcotism is suspended oxygenation. Whatever produces, to a certain extent, insufficient aeration of the blood, produces narcosis, and *vice versa.*

To produce anæsthesia the following causes combine, viz: 1. Preventing oxygenation; 2. Diminishing arterial supply; 3. Sluggishness or flow in the capillaries; 4. Subdual of energy of the nerve-filaments distributed to the lungs; 5. Shallowness of respiration, contributing to prevent free entrance of air into the blood.

I give here the views of Dr. Anstie, as the most rational, and supported by facts, as to the mode of death by chloroform:

"I believe death to take place in two ways, depending on the rapidity of absorption of the vapor. When the impregnation of the blood takes place with moderate rapidity, the sympathetic nervous system is the ultimum moriens and death begins at the lungs. When, on the contrary, the circulation becomes very rapidly charged with a large proportion of chloroform, the narcotic effect may fall with such force upon the sympathetic nerves as to extinguish their vitality at once.

"From the fact that, in an immense majority of reported fatal cases, the symptom of danger was confessedly the failure of the pulse and the blanching of the countenance, the conclusion appears strongly indicated that paralysis of the heart is *the* source of danger in surgical chloroform narcosis."

Death by shock is spoken of by a writer of an article in the *American Journal of Medical Sciences:*

"The fatal impression being a sudden influence upon the branches of the par-vagum in the lungs, produced by the inhalation of undiluted vapor of chloroform during the administration. That sudden impressions on the peripheral extremities of nerves produce a profound effect upon the internal vital organs, is one of the best known facts of physiology."

The report of the Committee of the Medical and Chirurgical Society of London contains the following:

Stage of Anæsthesia at which Death occurs.

Before full effects of chloroform, .	50
During " " " . .	52
Not stated	7
Total	109

Thus it will be seen that a great many deaths occurred before insensibility was established, and few when a profound action of the anæsthetics was sustained.

It is a generally-acepted fact that ether is less dangerous than chloroform, but testimony, by truthful authors, report deaths from ether. Trousseau reports nineteen. The Boston Society for Medical Improvement reports thirty-six.

Chloroform death-rate is much above that of ether in frequency. The relative danger of these two agents is impossible without figures, which cannot be obtained. Death occurs chiefly among males.

Dr. Snow's proportions are three males to two females; Kidd's, four to one; Sansom's, 2.8 to one. As to age, thirty years is stated as the average. The strong and muscular resist anæsthesia most, and, when produced, it is often deep

coma and profound stertor. The feeble bear anæsthetics better than the strong. Children are the best subjects of all. Women are better than men. Many deaths occur in the inebriate. Fatty degeneration of the heart is to be feared more than any other disease. The following is the diagnosis: Tendency to fainting; occasional dyspnœa, from congestion of the lungs; indication of atheroma of the arteries; feeble and intermitting pulse; countenance of a yellowish hue; congested state of the capillary vessels of the cheek. Stethoscopic examination reveals a feebleness in proportion to size of heart.

Chloroform has been detected, in the different tissues after death, in the following proportions: Blood, 1.00; brain, 3.92; liver, 2.08; flesh, 0.16. Distention of the right side of the heart with dark and fluid blood.

MODE OF INHALATION.

The best authorities state that all the anæsthetics (with exception of nitrous oxide) must be diluted with atmospheric air. Dr. Anstie gives 4.5 per cent.; Chloroform Committee, 3.5; 5 per cent. as the maximum amount—that is, 5 grains of chloroform to 100 cubic inches of air, The same may be said of bichloride of methylene and tetrachloride of carbon.

Ether being a much less powerful agent, can be used in a much larger per cent.

There are various modes used to administer the anæsthetics (vapor not gases,) such as the handkerchief, towel, sponge, cone, and by inhalers.

The great objection to nearly all these modes is, that we are in ignorance as to the strength of the vapor inhaled at any given time. At one moment, the air may be strongly impregnated with vapor, and, at another, pure atmospheric air is inhaled, so that there is no certainty about it.

The local effect on the air passages, when *strong* vapor is inhaled, are to produce spasms, manifested by coughing, and, if continued, struggling and possibly sickness. On the other

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The value of this inhaling apparatus consists in—

1. *Its safety.*—Air is at all times inhaled with the vapor, producing *good* anæsthesia without asphyxia. It is under complete control of the anæsthetist.

2. *Efficiency.*—The gradual inhalation of the vapor produces *less spasm* of the *epiglottis* (coughing) *struggling* or *sickness*, Anæsthesia is quietly produced and maintained. Rapid recovery from the anæsthetic.

3. *Economy.*—As all the vapor must past from the bottle to the lungs, there is consequently no loss of the anæsthetic. and little or no smell of ether in the room; a saving of two-thirds of ether or chloroform over the old way of administering.

4. *Simplicity.*—Consisting of an inhaler (mixing vapor and air at will,) connected to a bottle, from which the anæsthetic is inhaled.

5. *Cleanliness.*—As the apparatus is made of hard rubber and glass, it is readily kept clean.

A flexible border is stretched over the face-piece for children, or inhalation by either the mouth or nose. For the administration of nitrous oxide, the inhaler can readily be applied by connecting it to the gasometer or bag instead of the bottle.

I present here a summary, from a record of cases of anæsthesia with this apparatus, from the report of Bellevue and Charity Hospitals.

Whole number of cases, 50; males, 37; females, 13. Maximum age of patient, 58 years; minimum age of patient, 15 months.

Maximum time of ether inhalation, 1h. 10 minutes.
Minimum " " " 8 minutes.
Maximum time to produce anæsthesia, 12 minutes.
Minimum " " " 1½ minutes.
Whole amount of ether used, 256 ℥.
Minimum " " " 2¾ ʒ.
Maximum " " " 6½ ℥.
Average amount of ether used, 2 ℥ 5 ʒ.
Average time to produce anæsthesia, 5 minutes 7 seconds.
Average time anæsthesia was kept up, 27 minutes 24 seconds.
Average age of patient, 28½ years.

Or, on an average of the above cases, 2 ℥ 5 ʒ of ether will produce anæsthesia 5.1 minutes, and maintain it for 27 minutes 24 seconds, in a patient aged 28½ years.

. Only four cases of sickness which possibly might have been prevented somewhat by previous care. One, a case of amputation in a man with delerium tremens, died on sixth day. Autopsy showed an abscess of the brain, fatty degeneration of the heart with old pericarditis. He went through the etherization very well. Had no delirium after the opertaion.

An impromptu inhaler may be made as follows: Procure an oblong piece of stiff paper (a news paper will do,) about eighteen inches long by twelve inches wide. Place upon it a napkin or pocket handkerchief and fasten it by a few pins. Now roll the paper so as to form a hollow cylinder of about four inches in diameter, the inside being lined by the napkin to receive the anæsthetic. Air will enter the hollow of the cylinder, evaporating the anæsthetic and at the same time diluting it.

Mixtures of chloroform, ether, and alcohol have been advised, to avoid danger from the depressing influence on the heart's action.

The unequal rate of evaporating of the fluids is a prominent objection among others.

The best dilution to my mind, is a *well-measured sufficiency of atmospheric air.*

The following general rules are to be observed in administering the anæsthetics:

I. The anæsthetist should confine himself *exclusively* to the administration, and watch closely the symptoms.

II. The indices of danger are—1, the respiration; 2, the pulse; and 3, the countenance.

III. To prevent sickness, do not allow the patient any solid food *four hours* or liquid nourishment *two hours* before the operation. All alcoholic stimulants to be given at least *one half hour* before the anæsthetics are given, as this should be through the system and not in the stomach as one cause of sickness.

IV. Reassure the patient by gentle words and actions. Place your patient in a horizontal position, with the head raised a little, to let mucus and saliva go down the throat, and facilitate the breathing.

V. Loose the clothes and give all the muscles of respiration free play— especially the diaphram. Keep the body warm, and thus assist circulation and respiration.

VI. Avoid the spasm of the epiglottis (manifested by coughing,) by the gradual inhalation of the vapor, as this spasm undoubtedly affects the stomach also.

VII. Muscular tremor is always followed by muscular relaxation. In the strong and healthy this change is often quite sudden, so that care must be exercised, when the tremor subsides, to let the patient breath fresh air freely.

VIII. Cover the patient's eyes with a napkin while recovering from the anæsthetic, until sensibility and consciousness fully return, as it keeps them quiet (and they not unfrequently fall into a natural sleep,) for applying dressings, etc.

IX. Fresh air is the best stimulant for recovery. Let the patient exhale freely, to eliminate the vapor from the system. Give a warm cup of coffee or tea, and, if the patient is weak, add a little wine or brandy.

Resuscitation, in cases of danger, is accomplished by the only efficient stimulus, respiration, either natural or artificial.

Draw forward the tongue with your fingers or forceps, and keep it there by some means. Use either mouth-to-mouth inflations or by the methods of resuscitation by Dr. Marshall Hall, Sylvester, or Howard. The first is probably well known, and for that reason, and also that I much prefer the others, I will not give it here.

Dr. Sylvester's method is as follows: Draw the tongue forward. Place the patient on a flat surface on his back, slightly inclined from his feet upward, the chest being elevated on an impromptu cushion. Then grasp the arms and press them firmly against the sides of the chest. Next, immediately to raise the arms by the sides of the head and keep them stretched steadily upwards and forward for two

seconds. Repeat these measures alternately, with long perseverence and unfailing regularity, fifteen times in a minute.

Dr. Benjamin Howard's* *Direct Method* of artificial respiration is as follows:

"The patient is laid on the ground upon his back, his arms fully extended backward and outward, a firm roll of clothing being placed beneath the false ribs, so as to throw their anterior margin prominently forward. The tongue being held forward by an assistant the operator facing the patient, kneels astride his abdomen, and places both hands so as the balls of the thumbs rest upon the anterior margins of the false ribs, the four fingers falling naturally into four of the lower corresponding intercostal spaces on each side.

"The elbows of the operator being then planted against his sides, he has but to throw himself forward, using his knees as a pivot, and the entire weight of his trunk is brought to bear upon the patient's false ribs. If at the same time, the fingers of the operator grasp and squeeze the false ribs toward each other, these combined actions crowd the false ribs upward and inward, producing the greatest possible motion of the diaphragm and displacement of the contents of the pulmonary air-cells.

"The operator then suddenly lets go and returns to the erect position upon his knees, where both the in-rush of air and the natural elasticity of the ribs at this part cause instant return to their normal position.

"This repeated with proper rythm and frequency, constitutes the entire process.

"The advantages of this direct method over the indirect method of Sylvester and Hall, Dr. H. claims are:

"1. It is more simple.

"2. The degree of compression is felt and can be regulated by the operator.

"3. All the available anatomical Means for the displacement of air in the cavity of the chest are completely used.

"4. While the necessary motions are in progress, the tongue may be steadily held out, the limbs and entire body be dried and rubbed without interfering with the operator.

"5. No time is lost in superfluous motions.

"6. It is less fatiguing to the operator.

"7. It is more quickly taught to a bystander."

Galvanism of the phrenic nerves may also be used by placing one of the poles (armed with a wet cloth or sponge) over the situation of the phrenic nerve where omo-hyoid and sterno-mastoid cross the other pole along the course of phrenic, or at its periphery over the diaphragm (seventh intercostal space.) The current should be interrupted at regular intervals, to imitate the natural respiration.

**Medical Record* December 15, 1868, p. 467.

This can be applied in Dr. Howard's method, without interruption. Warmth and friction should always be applied. Warm air to the lungs by a bellows, when possible. When air cannot reach the lungs by the mouth, tracheotomy may be performed. Stimulants may be given by the rectum and by the mouth when the patient has recovered so as to swallow.—*New York Medical Journal.*

ARTICLE. X.

Diseases of the Jaw.

By Thomas Waterman, M.D., Boston.

1.—*Naso-pharyngeal Polypus. Extirpation preceded by Temporary Displacement of the Superior Maxilla.*—B.F.F., æt. 39. A polypus of the left nasal fossa has been steadily growing for four years. It is visible just within the anterior nares, can be felt behind the soft palate, and can be seen by raising the palate with a spatula. It is hard and firm to the touch, does not readily bleed, and is not accompanied by deafness. Its point of origin is plainly from the posterior part of the nasal fossa. The left side of the nose is distended by the polypus, giving to the face that characteristic expression accompanying similar growths.

In view of the size and obviously fibrous character of the growth, as well as its inevitable tendency, no other mode of removal than its direct excision at its point of origin seemed admissible, and this could be effected only by removing the upper jaw in a way and to an extent sufficient to expose the whole nasal fossa.

Operation.—A vertical incision was made from the nostril through the upper lip, and the cheek dissected up freely from the bone. The maxillary bone was then sawed horizontally across just below the floor of the orbit, from its outer border to the nasal fossa; the intermaxillary suture was divided by bone forceps, the mucous membrane of the hard palate having been previously incised along the median line. A broad chisel inserted into the cut made by the saw depressed the bone, fracturing it posteriorly at its connection

with the palate bones. By this deplacement and without any further detachment, the origin of the polypus could be easily reached; the growth, which consisted of many firm lobules, was cut and torn away from the sphenoidal bone into the cells of which it had penetrated. The point from which it grew was then thoroughly swabbed with Squibb's liquor ferri sulphatis, care being taken not to bring it in contact with the cut surfaces of the displaced bone. No ligatures were required. The polypus being removed, the bone was replaced and held in position by a silver wire twisted around the incisors on either side of the median section, a cork wedge was placed between the posterior molars, and the lower jaw bandaged firmly against the upper.

On the ninth day after the operation the patient was out of doors, on the eleventh an attack of erysipelas confined him to his bed again for a fortnight, but with no detriment to the progressing union of the jaw, which was perfected sufficiently to permit the removal of the wire on Oct. 18th, five weeks from the date of operation (Sept. 14th). On Oct. 28th, he was discharged from the Hospital by his own request. He had been able for ten days or a fortnight to chew meat with the teeth of the affected side, so firm was the union, and there was no deformity of the face, the trifling scar of the lip being invisible under his moustache. Two or three days before he left, a triangular piece of dead bone, about one inch long and one-third of an inch broad, came out through his nose. It appeared to be a portion of the palatal process of the superior maxilla.

Temporary resections, or osteoplastic resections, as they are termed in Europe, are characterized by the displacement of a bone still partially held in place by the soft parts; and by replacement of the bone, which has been thus rendered movable, as soon as the extirpation of the tumor is complete. The traces of the methods by which the surgeon obtained access to the tumor are thus effaced.*

* Rapport sur les Progres de la chirurgie, Paris, 1867; in this work a history of the operation of temporary displacement of the upper jaw may be found, also in the Sydenham Year-Book of Medicine and Surgery, 1865, pp. 271 and 295.

The result of these procedures, as well as that of complete excision of the upper jaw, illustrates the extent to which operations may be successfully practiced upon the bones of the face which protect and enclose important parts, but are independent of vital organs. The particular operation under consideration is undoubtedly a valuable resource in many cases hitherto requiring a still severer mutilation, but as shown in the case next reported it does not admit of universal application. The improvements of modern dentistry are available for the diminution of much of the deformity entailed by the entire removal of the superior maxilla ; an artificial jaw of vulcanite not only restores the dental arch, but ob viates the unsightly falling in of the cheek usually consequent upon this operation.

II.—*Pharyngeal Tumor. Extirpation preceded by Resection of Superior Maxilla.*—J. S. I., æt. 33. Fourteen months since a tumor of the size of a hen's egg, springing from the vicinity of the left tonsil, was removed by the ecraseur. It was thought at the time to be probably malignant, but his recovery from the operation was rapid, and on examining his throat no trace of its existence or point of implantation can now be seen. Within two months his ability to blow air through the left nostril has gradually ceased, at present it is entirely obstructed. The right nostril is also partly obstructed, and to an increasing extent. His deglutition as well as respiration is difficult. On introducing the finger behind the soft palate a growth having a broad surface of origin from the basilar process of the spheno-occipital bone fills the left half of the space between the base of the skull and the posterior nares. The finger can with difficulty be swept around the tumor on account of the small space unoccupied by it, but its attachment and the constriction of its base can readily be felt. No part of the tumor enters the nasal cavities, it cannot be seen from the anterior nares, nor is there any external or visible deformity. The tumor is symmetrical in shape, bleeds on touch as it also does spon-

taneously or from sneezing, is firm and hard, though friable, and is not painful or sensitive. There is no enlargement of the lymphatic glands. It was not inspected with the aid of the rhinoscope. As the disease was inaccessible for thorough and complete removal, without the excision of the left superior maxillary bone, neither the division of the soft palate (*Manné*) nor the partial removal of the hard palate (*Nelaton*) offering any chance of getting at the tumor, that operation was performed Oct. 12th, by the method usually described as of Velpeau. Through the aperture thus afforded the tumor was rendered visible as well as accessible, presenting a round convex mass an inch and a half in diameter furrowed by the septum of the nostrils. It was removed with the aid of curved scissors, the bone from which it grew was cut away with the gouge, although not apparently diseased, and the surface thus denuded, as well as the soft parts adjoining, were swabbed with Sqibb's liquor ferri subsulphatis. Two or three ligatures only were required.

The tumor under the microscope proved to be glandular rather than malignant. According to Dr. C. Ellis, "it was composed of rather small nuclei, with pale nucleoli somewhat larger than those usually found in glandular growths, but resembling them in other respects. A few doubtful lobules and some fragments of lobules were also seen. There were also found some fibrous tissue and a few minute blood-vessels. Very few, if any cells, and those of small size."

On the third day from the operation the stitches were removed from the incision in the cheek; on the ninth the patient sat up, and on the fourteenth he was discharged.

In February last he visited the Hospital wearing an artificial jaw which, exclusive of the palatine arch, was not more than one inch in diameter, so completely had the cavity left by the operation filled up. The scar on the cheek was invisible beneath his whiskers, there was no falling in of the cheek, dropping of the lower eye-lid, nor paralysis of the face. The tone of his voice was not noticeably nasal, and there had been no recurrence of the tumor.

III.—*Hypertrophy of Gums. Partial Resection of Superior Maxilla.*—M. A. S, a young woman of average mental capacity, æt. 27. She has never been in good health. Her mother and her nurse say that the disease of which she is the subject is not congenital, but ever since the patient herself can remember she has been asked "what is the matter with your gums?" She has repeatedly had abscesses about the mouth, gum-boils, catarrh, and suffered most of her life from thick speech, deafness, difficult deglutition and dull pain in the jaws.

On examination the gums are seen to be hypertrophied along each side of the dental arches, not uniformly, but more prominently at some points than at others. The principal outgrowths are in front of the canine and incisor teeth in the upper jaw; in the lower jaw they occupy the place of the molar teeth on both sides. In the palatine arch of the superior maxillary bones two projecting excrescences, having their attachment anteriorly, pass backward, concealing the soft palate; in the cleft between them the uvula can be seen. On passing the finger into this cleft it can be swept around slightly, the soft palate and a small part of the hard palate not being connected with the growth. These excrescences feel quite hard and non-elastic. The portions which project backward are somewhat movable, and can be pressed up so as to touch the palate.

At various times several teeth have been extracted, and the patient thinks that this has caused the growth to shrink somewhat, but the changes have been slight during the last eight years.

On the 26th of June all the teeth of the upper jaw were extracted, and and at the same time those portions of the excrescences of the upper jaw which concealed the soft palate were sliced off. The patient was discharged on the 3d. of July, and re-entered the Hospital Oct. 8th. The disease in the meantime had remained quiescent.

Oct. 9th, the whole of the outgrowths were removed with the gouge, and the dental border of the superior maxilla

sawed off. The wounds healed rapidly, and on the 21st of Oct. the patient was discharged, with the cut surfaces granulating in a healthy manner.

The rarity of the disease has led me to report this case, the interest of which centres in the peculiarity and infrequency of such an hypertrophy, rather than in the result of the operation.

I find but three recorded cases of this disease, one by Prof. Gross,* one by Mr. Pollock,† and a third by Mr. Heath,‡ occurring under the care of Mr. Erichsen, in Univ. Coll. Hosp. In the first two cases the disease was congenital, and returned to some extent after removal. A very remarkable specimen of this disease presented itself in the person of a female of feeble intellect, covered with a remarkable hairy growth, who was exhibited by a showman in this city some ten years ago under the name of "Bear Woman." The hypertrophy of the gums was even more conspicuous than in the recorded cases. It is a little singular that Mr. Pollock's case was characterized by an extraordinary pilous development, and the patient a subject of epilepsy. Dr. Gross's patient was a stunted and feeble-minded boy.

Under the microscope the disease presented a purely fibrous growth, without myeloid cells, distinguishing it from epulis, with which, however, it was little likely to be confounded, neither the general aspect nor the mode of its growth bearing resemblance to the distinct masses and interdental origin of that affection.

The gross appearances of hypertrophied gums resemble the disease called lampas, occurring in the horse. The latter however, is an *inflammation* of the gums, propagated to the bars of the roof of the mouth, and rising to a level with and even beyond the teeth. It usually subsides without treatment, or only requires slight scarification.

IV.—*Tumor of the Lower Jaw from a misplaced Wisdom Tooth. Operation for its removal.*—A colored woman,

* Gross's System of Surgery, 2d edition, Vol. II., p. 534, fig, 330.
† Holmes's System of Surgery, Vol. IV., p. 18.
§ Injuries and Diseases of the Jaws, London, 1868, p. 189.

æt. 41, ten years ago noticed an enlargement of the lower jaw on the left side, near the angle in the region usually occupied by the molar teeth. No permanent molars had ever appeared on that side, and it was the patient's conviction that there never had been any deciduous molars. The enlargement of the jaw was principally of the alveolar border, and this finally grew to such a degree as to prevent bringing the teeth together. Under these circumstances, five years ago a portion of the tumor cartilaginous in density was shaved off. A new growth gradually replaced what was removed, and there is now an enlargement of the entire bone, firm, inelastic, slightly irregular in outline, sensitive on the inside to touch, and whenever hard morsels are bitten upon. It is hardly of sufficient size to be visible from the outside, but can readily be felt, and it projects inwards about to the same extent. The jaw is perhaps double its natural thickness. For the last six months the tumor has been the centre of a radiating neuralgic pain constantly present, and so severe as to make the patient willing to undergo any operation likely to give her relief.

Removal of a portion of the continuity of the jaw being attended by disability and disfigurement, it was thought best to perform a temporizing operation, and excise so much of the tumor as could be from the inside of the mouth. In chiselling away the bone, which was dense and vascular, a well-formed wisdom tooth was found impacted in the jaw bone in a horizontal position. As this was deemed to have been the source of all the suffering as well as to constitute the tumor, no further steps were taken toward its more thorough extirpation. The operation was followed by complete disappearance of the pain. The wound rapidly granulated, and at the end of three weeks the patient was discharged at her own request.

The crown of the tooth removed was found to be enveloped by the membranous sac originally lined with enamel pulp, which having fulfiled its function had become detached from the surface of the enamel, and now remained as a

capsular investment of that portion of the tooth. The sac thus formed was not distended with serous fluid into a "dentigerous cyst," as occasionally occurs, and an instance of which was reported in 1863,* but retained its original proportions. The case must therefore be looked upon merely as one of impacted misplaced tooth, and the specimen is interesting from its deep-seated position, and as exhibiting the *pathogenesis* rather than the *pathology* of dentigerous cysts, in a manner all the more satisfactory from the rarity with which an opportunity is afforded for their study.

The subject of dentigerous cysts has been treated of at length by Mr. Salter.†

(The preceding cases of more than usual interest occurred in 1867, at the Massachusetts General Hospital.)—*Boston Med. & Surg. Journal.*

* Trans. Boston Soc. for Med. Improvement. Vol. V. ,p 100.
† Guy's Hosp. Reports, Vol. V., 3d Series, p. 319 and Holmes's Surgery, Vol. IV., p. 32.

ARTICLE XI.

Varieties of Food—their Chemical Composition and Nutritive Value.

Animal Foods.—First on the list of these is *milk*, a liquid which contains all the elements of food required by the very young, and is therefore regarded as the type or standard of food.

In some countries, as Switzerland, it is the chief diet of the peasantry; and everywhere, if easily obtained, it is largely consumed. 76 per cent. of the laboring classes of England make use of it; 83 per cent. take it as butter-milk, and 53 per cent. as skimmed-milk. In Wales, the average consumption of it by farm laborers is 4¼ pints per adult weekly—South Wales averaging only 3 pints, while in North Wales it is 7½. In Scotland the consumption among the laboring classes is still larger, for it amounts to 6¼ pints per head weekly, and in Ireland it reaches 6¾ pints. Those who take

*From the Cantor Lectures, delivered before the Society of Arts, by Dr. Letherby, M. A.

least of it are the poor in-door operatives of London; the weavers of Spitalfield, for example, use only about 7·6 ozs. per head weekly, and those of Bethnal Green only a fraction above 1½ ozs. per head. When examined under the microscope, milk is found to consist of myriads of little globules of butter floating in a clear liquid. On standing for a few hours the oily particles rise to the surface and form a cream, the proportion of which is the test of quality. Cow's milk is heavier than water in the proportion of from 1,030 or 1,032 to 1,000. Asses' milk is the lightest, for its gravity is only about 1,019; then comes human milk, 1,020; and. lastly, goats' and ewes' milk, which is the heaviest of all, from 1,035 to 1,042.

The quality of milk varies with the breed of the cow, the nature of its food, and the time of milking, for afternoon milk is always richer than morning, and the last drawn than the first. Taking, however, the average of a large number of samples, it may be said that cow's milk contains 14 per cent. of solid matter, 4·1 of which are casein, 5·2 sugar, 3·9 butter, and 0·8 saline matter. The relations of nitrogenous to the carbonaceous is 1 to 2·2; but as fat is 2½ times more powerful than starch, the relation may be said to be as 1 to 3·6.

When milk is heated to the boiling temperature, the casein is coagulated to some extent; and if the milk has stood before it is heated, so that the cream may rise, the coagulum includes the cream, and makes the so-called Devonshire or clotted cream.

Acids also coagulate the casein, and produce a curd, as in the making of cheese and curds and whey.

Cream is rich in butter. It contains 34 per cent. of solid matter, 26·7 of which are butter, and its gravity is about 1,013.

Skim-milk is the milk from which the cream has been removed. It contains only about half as much butter as new milk, and its gravity is about 1,037. In all other respects it is similar to new milk.

Buttermilk is the residue of the milk of cream from which the butter has been removed by churning. It is still poorer in fat than skim-milk, containing, in fact, only about half as much. Unless it is very fresh, it is generally a little acid, and frequently the acidity has gone so far as to set the milk into a kind of jelly.

The whey of milk is the opalescent liquor from which the curd has been removed in making cheese. Although not highly nutritious, it still holds a little casein in solution, as well as the sugar and saline matter of the milk. It is rarely used as food by the poor, but is given to pigs. In Switzer land, however, it is considered to have medicinal virtues, especially for the cure of chronic disorders of the abdominal organs, and the treatment, which is somewhat fashionable, goes by the name of *cure de petit lait.* There is a popular notion that the whey of milk is sudorific, and hence we have our wine whey, cream of tartar whey, alum whey, tamarind whey, &c., when the milk has been curdled by these several substances.

Cheese is the coagulated product of milk, obtained by the addition of rennet or a little vinegar. When cream is coagulated it makes cream cheese, which will hardly bear keeping, but must be eaten fresh. It contains about half its weight of butter, and a fifth of its weight only of curd.

When cream is added to new milk, and the mixture is curdled, it forms very rich cheese, as double Gloucester and Stilton.

When new milk alone is used the cheese is less rich, but still of high quality, as Cheddar.

When an eighth or a tenth of the cream has been taken off, it produces the quality of cheese which is most sought after, as single Gloucester, Chester, American, &c.

And when all the cream has been removed, and the skim-milk is curdled, it forms the poor cheese of Holland, Friesland, Suffolk, Somersetshire, and South Wales.

At first every variety of cheese is soft and comparatively tasteless, but by keeping they undergo change, and develop their flavors, when they are said to be ripe.

Analyses of two of the most important of them show that they contain from 56 to 64 per cent. of solid matter, about half of which is curd. In skim-milk cheese the curd amounts to 44·8 per cent., and the fat to only 3·6; whereas, in Cheddar, the curd is only 28·4 per cent., and the fat 31·1. In nutritive power, therefore, especially in nitrogenous matter, cheese ranks high, and is a valuable article of diet; but there is a limit to its digestibility, and hence it cannot be taken in large quantity. Considering its price also, it is hardly so profitable as many other foods; although where good skim-milk cheese can be purchased at from 2½d. to 3d. per pound it forms, in small quantities at a time, a good adjunct to bread.

Concluded in the July number.

MONTHLY SUMMARY.

Death from Hypodermic Injection.—Lantesson reports that he saw a child die in a few moments with convulsions, after he had injected several drops of liquor ferri sesquichlor. for nævus maternus. Dissection revealed large coagula in the roots of the great veins at the heart and in the right auricle and ventricle. He supposes that a vein of some size was wounded, and that the astringent thus got into the general circulation, coagulated the blood, and finally produced paralysis of the heart. He recommends that the flow of blood into neighbouring venous plexuses should be prevented by pressure when we perform this operation. —*St. Louis Med. Reporter.*

Danger of Giving Strong Doses of Camphor.—A case illustrating the above has recently been brought under the notice of the Société de Médicine et de Pharmacie de Grenoble. A enema consisting of five grammes of camphor dissolved in the yolk of an egg, was given to a child three years of age, suffering from typhoid fever. Symptoms of poisoning at once manfested themselves; convulsions, lividity of countenance, stupor, arrest of the urinary secretion, etc. The employment of coffee sufficed to restore the child.—*Ibid.*

The Three Varieties of Dyspepsia.—By Dr. Henry Browne M. A., Manchester. He recognizes three principal kinds of Dyspepsia, which he calls respectively sulphuretted hydrogen dyspepsia, or that accompanied with "rotten egg" eructations; carbonic acid dyspepsia or that evidenced by tasteless eructations; and butyric acid dyspepsia in which the eructations are sour or acrid. To a patient suffering from the first named of these he recommends abstinence from meat and eggs, and prescribes farinaceous diet, along with a mixture containing strong hydrochloric acid, chlorate of potash, filled up with a vegetable bitter. In the case of patients afflicted with carbonic acid dyspepsia he orders a lean meat diet and an avoidance of bread, potatoes, and farinaceous diet generally; while to the third class he prescribes the use of sugar and fat. Dr. Browne is fond of pointing out the incalculable harm done to the digestive system by an immoderate indulgence in tea, and in his, as in every medical out-patient room, he finds abundant illustrations of his observations. These cases he styles "tea dyspepsia," and he relies for a cure of them upon a daily allowance of wine, regularity of meals, and abstinence from tea. He insists very strongly on the necessity of wearing flannel, especially in the rheumatic diathesis, enjoining upon his patients the use not only of flannel jackets or shirts, but also of flannel drawers and woolen stockings; and he invariably adds this precept—"Never wear during the night the flannel clothing you have worn during the day, but change your flannel garments night and morning, taking care to have them well aired and dried in the meantime.—*Medical Times and Gazette,and Braithwaite.*

Excessive Sweating of the Hands or Feet.—For the relief of this troublesome affection, Dr. Donilt recommends the thorough application of the hottest water that can be borne without pain to the offending parts until they are red hot and tingling as if scalded. This treatment the author states, sometimes appears to aggravate the affection. Hebra recommends the frequent local use of a solution containing one drachm of tannic acid mixed in six ounces of alcohol; this liquid should be rubbed into the parts several times a day, and the skin must not afterwards be wiped; a little powdered asbestos is to be sprinkled on it while still wet and with this the part is to be rubbed till it is dry.—*American Eclectic Medical Review.*

Sleeping Sickness (*Maladie du Sommeil,*)—A short article with the above title, by Dumoutier, a surgeon in the French Navy, appears in the *Gazette des Hospitaux*, Oct. 13, 1868. The disease was met with on the coast of Africa, and especially in the territory of Gabo and Congo. There is an irresistible tendency to sleep, accompanied with no suffering, but with a general weakening of the limbs; the gait is uncertain, and the tactile sensibility seems perverted. During the sleep, the fæces and urine are voided involuntarily. Intelligence seems unaffected, respiration is normal and digestion regular. The patients are shunned by their companions.

The disease is observed more especially among the slaves or captives from the interior, who have undergone great suffering and performed excessive work with insufficient and bad food—and who are the victims of chagrin, ennui and despair.

Strychina, tonics, exercise and electricity were employed, all to no purpose.

At two autopsies, no change was found either in the brain, the cord, or their membranes.—*Boston Medical & Surg. Jour.*

The Bi-sulphide of Carbon.—We have several times called attention to this curious substance. Recently in an English journal Dr. G. Kennion speaks of it as a cure for headache. He says: Its mode of application is simple. A small quantity of the solution (about two drachms) is poured upon cotton wool, with which a small, wide-mouthed, glass stoppered bottle is half filled. This, of course, absorbs the fluid, and when the remedy has to be used, the mouth of the bottle is to be applied closely (so that none of the volatile vapor may escape) to the temple, or behind the ear, or as near as possible to the seat of pain, and so held for from three to five or six minutes. After it has been applied for a minute or two a sensation is felt as if several leeches were biting the part; and after the lapse of two, three or four minutes more, the smarting and pain become rather severe, but subside almost immediately after the removal of the bottle. It is very seldom that any redness of the skin is produced. The effect of this application, as I have said, is generally immediate. It may be reapplied, if neccessary, three or four times in the day.

The class of headaches in which this remedy is chiefly useful

is that which may be grouped under the wide term of "nervous." Thus neuralgic headache, periodic headache, hysterical headache, and even many kinds of dyspeptic headache, are relieved by it; and although the relief of a symptom is a very different affair, of course, from the removal of its cause, yet one who has witnessed (and who of us has not seen?) the agony and distress occasioned by severe and repeated headache, but must rejoice in having the power of affording relief in so prompt and simple a manner.

As regards the *modus operandi* of this remedy, it is difficult, perhaps, to form a certain opinion; but I am disposed to attribute it to the sedative effect of the vapor of the bisulphide, absorbed through the skin, and acting upon the superficial nerves of the part to which it is applied. The remarks of M. DELPECH (*Annales d'Hygiene*, January 1863,) point out very clearly the remarkable prostration of the whole nervous system produced in workmen who, in certain manufactures, are exposed to the vapor arising from a solution of the bisulphide of carbon; and we can readily understand that a somewhat similar effect, upon a small scale, may be produced by the application of this vapor to a limited portion of the surface.—*Med. & Surg. Reporter.*

EDITORIAL DEPARTMENT.

Local Anæsthesia for Incipient Alveolar Abscess.—Dr. Chase in an article on "Alveolar Abscess," published in the *Missouri Dental Journal*, refers to a method pursued by Dr. Judd, of treating the incipient form of this disease by means of local anæsthesia induced by Richardson's apparatus. The following directions are given for its application:

"The tooth should be frozen its whole length, which will take from fiften to thirty minutes, *Immediate* relief from pain will ensue, and in many cases will not return."

Dr. Chase speaks of having used the spray for this purpose in one case with perfect success.

Charleston S. C. Dental Association.—We have received from the Secretary a copy of the Constitution of this Association, which was organized in December 1867, with Drs. Patrick, Solomon, Brown, Chupein, Muckenfuss, Bull, Shaffer and White as original members. The regular meetings are held on the second Tuesday evening of each month, and its present officers are Dr. J. B. Patricks, President,—Dr. W. S. Brown, Vice-President,—Dr. T. F. Chupein, Secretary and Treasurer.

Suspension of the New York College of Dentistry.—We regret to learn that the "New York College of Dentistry" no longer exists, its charter having been annuled by the Supreme Court of the State in an action brought by the Attorney General. This action was instituted on a presentation of the condition of the College by a member of the faculty, who considered the acts of a majority of its Board of Trustees to be in direct violation of its charter.

The case came up before Judge Cardozo, and an injunction was granted and a receiver appointed to take charge of the property of the College on the 22nd of April last.

Previous to any steps being taken to annul its charter, no less than six of the most prominet members of its Board of Trustees resigned

As we are well acquainted with the untiring efforts of its former faculty to make it worthy the support of the profession, and of the pride they felt in its welfare, we deplore its fate and deeply sympathize with those who have expended so much time, labor and means in its behalf.

This is the second College of Dentistry which has been organized in the State of New York, and we had hoped that, unlike its predecessor, its career would be a long and prosperous one.

The Meeting of the American Dental Association.—The attention of those of our readers who purpose attending the next meeting of the American Dental Association, which is to be held at Saratoga on the first Tuesday in August, is directed to the communication of Dr. Ambler, Chairman of Committee of Arrangements, which is published in the present number of the *Journal.* As this meeting is held at a time when Saratoga is thronged with guests, it will be necessary for all who desire good accomodations to notify Dr. Ambler; otherwise it may be impossible to secure rooms at the hotels.

Erratum.—In the April No. of the *Journal*, under the head of "Notes from Dental Practice," in the recipe given for the treatment of Alveolar Abscess, instead of the abreviation gtt. at the end of the recipe, read *M.* or *Misce.* The error was due to the minim marks being changed to the drop marks after the proof was corrected.

As this is a valuable recipe we give it as it should read: ℞ Tinct. Iodine Comp. gtt. xiv. Acid Carbolic Cryst, (fusa) gtt.vj. Glycerinæ ʒ viij. Aq. Destillat, ℥ v. Misce.

It is well to state that after mixing, the dark color of the Comp. tinct. of iodine gradually disappears, and the solution at length becomes colorless, this change being entirely due to the carbolic acid. This solution possesses artificial and stimulant properties, and can be used in the form of injections, gargles, and lotions in diseases of the mucous membrane, ulcers, abscesses, &c.

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ARTICLE I.

Anæsthesia in Dental Operations,

By Thos. C. Edwards, D.D.S.

Anæsthesia is defined in Medical Dictionaries as being "Privation of feeling," "Loss of the sense of touch," "Insensibility," &c. But these definitions do not suit my present purpose, not being comprehensive enough. I may add though that the above definitions are better suited for public use than the one I intend giving, in fact they express the literal meaning of anæsthesia more nearly than the one I will give, but I contend that the definition does not express the full meaning of the term as at present applied. As is well known, simple and comprehensive definitions do more towards shortening wearisome details than anything else, therefore, I feel justified in adopting the definition which follows especially as it originates from good authority.

Dr. Anstie in his work on "Stimulants and Narcotics" gives a definition of the term "Narcosis," which without argument I will state applies equally to the term anæsthesia. It is as follows:—"A physiological process in which the Nervous System is deprived of its vital characteristics, through the means of a poisoned blood supply, and which tends to produce general death of the organism by means of such deprivation." This definition I think comprehends

in so many words as much as I could describe otherwise in as many pages, therefore, I feel no hesitancy in adopting it. I might substantiate my position by numerous facts and arguments, but will not intrude so far upon time and patience.

The fact is, that no arguments of mine are required to prove the correctness of the definition, as in the minds of all good physiologists the definition substantiates itself. (As a matter of course I have left local anæsthesia out of the question, the action of a local anæsthetic bearing about the same relation to chloroform or ether as used in general anæsthesia, as a mustard plaster does to some internal stimulant).

The use of anæsthetics has become very common in the various branches of Surgery since their first introduction in 1846, although for some time they were regarded with suspicion and distrust; and not without some reason, for truly to look at the symptoms produced by them, one would justly conclude that some danger lurked there; and, as the use of them has long since sadly proven, they are extremely dangerous agents and only require certain conditions (which are unfortunately very obscure) to produce death. Notwithstanding all this they came largely into use, and are now used almost universally in surgical operation even down to the extraction of a tooth. It is true that the action of anæsthetics are better understood than formerly and as a consequence they are not so dangerous when in proper hands, still statistics prove the important fact that about as many die under the action of the agents as formerly, therefore something is wrong. Either great carelessness is displayed in their use or somebody is using them that is ignorant of the conditions unfavorable to their use. I adopt the latter conclusion as the former is rather detrimental to professional honor and dignity. It might be said that the latter conclusion is equally so, but I think not, for how many doses of medicine are given when the physician is in the dark as to their action upon the system. This is the point I have been aiming at. Here we have the whole Medical World, including all its branches &c., using anæsthetics as well as

many other agents less dangerous, of whose real action upon the economy they are positively ignorant, save the symptoms they produce. What a cutting satire it is upon the wisdom of the physician, how humiliating the reflection that one set of these healers of mortal ills are giving medicine according to one theory to produce a given effect while another set are giving the same agents according to some other theory to produce precisely the same effects. This is all well and good to a certain extent. but there is, I think, a limit to this as well as everything else in human affairs. This thing of the right of the physician or surgeon to use anæsthetics, considering the prevailing ignorance in regard to their action, and the known danger that attends their administration is, I think, one of serious import and one that demands attention. The showman in a menagerie has the right to put his head into the lion's jaws and risk the danger of having it bitten off as occasionally happens, but none would wittingly confer upon him the right to stick anybody else's head into the lion's jaws, for the showman has only a limited conception of the forbearance of the lion under such circumstances and he is not justified in exposing anybody else to such danger. Anæsthetics are dreadful roaring lions with capacious jaws, sufficient to gulp the poor unfortunate who so rashly thrusts his head into them, when the proper conditions for deglutition or decapitation are present. An obscure lesion of the brain, heart or lungs will sometimes fulfil these conditions, and the poor, ignorant patient quietly goes on with the anæsthesia, until he gently snaps the thread of life and death steps forward and relieves him of his burden.

This is a pretty dark picture I have drawn I admit, and might be modified considerably, but it is better to view this subject in such a light than to treat it lightly, think of it lightly, use anæsthetics rashly and some day "shuffle" some of our patients "off this mortal coil." The proportion of deaths during anæsthesia is comparatively small it is true, so are the the killed and wounded in battle to those who escape unhurt, but there are numerous recorded deaths by anæsthesia which will speak for themselves.

A great many speak up for Nitrous Oxide and defy any proof by statistics or otherwise that death has ever been produced by it and so on, but Nitrous Oxide although a mild sweet little sister as compared with her more boisterous, rampant brothers Ether and Chloroform, possesses the same lurking, dangerous disposition and may be regarded with deep suspicion. She is young yet and has not given to the world a full exhibition of her powers, but mark you, she will. Look at those livid lips, that dull starving eye, those palsied limbs, the banishment of intelligence into dreamland, that fluttering pulse and stertorous breathing and say she is harmless. Nevertheless the ignorant public *will* have them even in the most trivial operations, and Surgeons, Dentists, &c., *will* use them. So it cannot be avoided and the Surgeon's conceit in his wisdom and sagacity may hob nob with his conscience to its hearts content for aught his patient knows or cares.

But I am not arguing the entire disuse of anæsthetics in the above at all, for I think that that there are circumstances under which the production of anæsthesia is not only justifiable but necessary. In fact, to look at it in one light it is a great boon and blessing to suffering humanity. The poor, miserable patient, who after weeks or months of anguish and pain is drawn upon the table for the surgeons knife, needs something to avert the cruel shock to his nervous system which necessarily follows these operations. Delicate females also sometimes derive great benefit from the use of anæsthetics during the pains of labor, but after all, I think that in this instance they are used to produce their stimulant effects and are not used as anæsthetics.

I think it advisable and even necessary in all the operations of surgery in which great shocks to the nervous system may be expected from excessive pain, loss of blood, etc., and, in fact hardly see how the surgeon could well dispense with the use of them. But I hold to the opinion that the majority of cases in minor surgery could be disposed of without the use of anæsthetics, and especially could Dentists do so. No Dentist is ever justified in giving Ether, Chloroform or

Nitrous Oxide for the purpose of extracting a few teeth. The responsibility he assumes in such cases is a very grave one, and he should look well to the consequences that he may not have cause to reproach himself afterward.

Another very important reason for the nonuse of these agents by Dentists, is that their operations are performed invariably in the sitting posture, which is very unfavorable to a safe and perfect induction of anæsthesia; also during those stages of anæsthesia in which it would be advisable to commence operating, the Dentist finds it impossible to do so, on account of the rigidity of the jaws, in this dilemma he seeks success by producing a deeper anæsthesia in which the rigidity is succeeded by one of total relaxation; in fact he marches his patient up into the jaws of death and trusts to luck for him to get out.

I could enumerate many reasons for not using anæsthetics in dental operations but consider it a useless waste of time. If it could be proven satisfactorily that Nitrous Oxide was perfectly safe, and so far it has not, I would welcome it as as gift from Nature's laboratory, and would use it with much pleasure. As to ether and chloroform they are out of the question, I do not hesitate to deprecate in the strongest terms their use by any Dentist. I feel when I am using these agents that I am dealing with agents, the actions of which I do not clearly understand; and I am doing myself no injustice in saying so, for the best physiologists have not sifted the matter perfectly. I only know that when an anæsthetic is administered it seeks the vitals, sucking up the springs of life, overwhelming all those avenues through which the mind communicates with the outer world, and finally if the anæsthesia is carried far enough, totally extinguishes the vital spark. Sometimes too, in the midst of this beautiful, rapid, ebbing, stream of life, when the patient is being rapidly whirled along breaking link after link in the chain of life, dread disease, lying hidden and obscure somewhere in the organism starts up and with rude hand snaps asunder the cords of life.

These are not merely visionary speculations of mine, they are stern practical truths and come home to myself. If I have taken an incorrect position, experience being an excellent teacher and very kindly when properly treated may set me to rights again. Experiment is very valuable and efficacious in teaching us the great truths of Nature, and I shall be proud to avail myself of it on all occasions in which it is justifiable, but I cannot feel justified in experimenting upon my fellow beings when theprobability of a fatal result stares me in the face.

In these few pages I have, I think, illustrated satisfactorily the point which I aimed at, viz.—the necessity for caution in the use of anæsthetics, which is, I regret to say, becoming very much neglected at present. Dentists use them indiscriminately, but more especially is Nitrous Oxide coming into general favor in the Dental profession. I shall certainly exercise caution in their use, letting others if they wish try dangerous experiments. Local anæsthesia scarcely demands a notice in this essay as the general tenor of all my remarks have been in another direction than the mere action of these agents; still local anæsthetics do have an action on the system and in a few remarks I will pass them by. Their action is quite simple and harmless and if they are half as efficient as they purport to be they are very valuable. By freezing the parts to be operated upon they destroy sensation and render the operation painless. This is the whole modus operandi of their use &c., as is urged for them. I am somewhat suspicious of these agents, I do not regard them with much favor as I have never yet seen a good result follow their use, and I have seen a good many operations performed while under their influence, and never in a single case has the patient professed entire freedom from pain.

ARTICLE II.

The Blood.

By Geo. Fisk Keesee, D.D.S.

The human body requires for its maintenance the various processes of digestion, absorption, secretion, excretion, circulation and respiration, which in connection with the several organs and parts of the body fulfil their destined work in the formation, movement, and purification of the blood which is the great motive power of the body.

Blood, the nutritive fluid of the tissues, may be seen circulating in the vessels of a living part as a colorless fluid, but containing small particles, red predominating, which give to the blood a characteristic color. To this colorless fluid has been given the name of liquor sanguinis, and in this fluid is suspended the blood and lymph corpuscles. The liquor sanguinis consists of water in which are dissolved fibrine, albumen, chlorides of sodium and potassium, phosphates of soda, lime and magnesia. Blood when flowing from a wound is a thickish, heavy fluid presenting two different appearances as it may proceed from an artery or a vein, when from the former, it is of a beautiful bright scarlet color, but of a very deep purple when from the latter; these colors, however, are subject to many changes, as the blood may proceed from deep wounds or from asphyxiated persons, but the natural color will be restored on exposure to the light. If we reckon the specific gravity of water at 60° F. to be 1000 we find the average specific gravity of blood to be about 1055. Its general temperature is, however, from about 95° to 102°F., it is alkaline, and gives forth an odor similar to the smell of the fur or breath of the animal from which it flows.

Experiments have proven that on account of the preponderance of the red corpuscles in the male over the female, so on an average the specific gravity of the blood of the former is greater than the latter. When drawn from the body, or if it has escaped in any way from the blood vessels, and allowed

to remain perfectly still, the blood undergoes some singular changes which serve to show its constituents. In about from ten to twelve minutes it assumes a jelly-like consistency without any apparent diminution in quantity or quality save that it now appears as a solid, caused by the coagulation of the fibrine together with the entanglement with it of the corpuscles, forming a clot or crassamentum. Within a short period of time this clot begins gradually to contract, thus forcing out the watery portion (serum) which retains the albumen and the saline matters, within which the clot now floats as a firmer, harder substance than before. The rapidity with which this takes place, the relative bulk of the serum and the clot, and the firmness of the latter, vary with circumstances. Spontaneous as the coagulation of the fibrine may be, yet of the above named circumstances affecting it may be mentioned the presence of an abundant supply of fresh air, for by this means the carbonic acid is more rapidly removed. The surrounding temperature greatly affects its coagulation, being greatly retarded by cold, indeed being entirely prevented by being kept at a temperature below 40° F.; in the same proportion as it is retarded by cold, so in a like proportion is it accelerated by heat until it reaches about 123° F. at and above which point it is retarded, as is also the case where death has occurred from sudden shocks as lightning. Rest has been regarded by some as necessarily essential to its coagulation; whilst, no doubt, it is a great auxilliary, yet proofs have been afforded that such is not the case, for coagulated fibrine may be readily obtained from the blood by stirring it with a small bundle of twigs. The size and firmness of the clot depends on the amount of fibrine in the blood, which in health averages about 2.3 parts in 1000. The color of the blood varies as it happens to come from the venous or arterial side of the heart. The florid scarlet arterial blood passing through the capillaries loses its oxygen becomes loaded with charbonic acid and appears in the veins of a dark purple color which it changes again for scarlet when it is sent to the lungs there to part with its carbonic

acid and to absorb a fresh supply of oxygen. It seems propable that this change is owing to the effect of the oxygen on the corpuscles contracting them and altering their reflecting surfaces, carbonic acid on the other hand rendering them thinner and more flaccid.

By the process of coagulation we are furnished with the three principal constituents of the blood: 1st. the fibrine or coagulating portion, 2d. the serum, 3d. the blood corpuscles. Pure fibrine is a solid, tough, elastic substance composed of thready fibres, is whitish, inodorous and insoluble in cold water, and in healthy venous blood as before said, is about 2.3 parts in 1000. Experiments have proven that the fibrine is the only spontaneously coagulable constituent in the blood, but why this is physiologists have been unable to decide. For some length of time it has been a disputed question as to whether the coagulation of the fibrine is a process of organization or not, but more recently light thrown upon the subject by learned physiologists lead us to regard it as not being a process of organization. After the coagulation of the fibrine we have the serum remaining, it is not, however, all immediately collected, but as the clot continues to contract, more and more is pressed out, varying in different cases as to quantity as the per centage may exist in the blood and also with the rapidity with which the clot may have been formed. Its specific gravity is rather below that of the blood being only about 1028. The corpuscles are of two kinds, white and red. We are left in much doubt as to whether or not the red corpuscles are derived from those which are characterized as the white.

But making use of the best light given to us we are inclined to the opinion that the red do have their origin in the white or colorless corpuscle. The red are peculiar to vertebrate animals and to them the blood owes its characteristic color, they are circular, flattened disks varying much in size the greater proportion being in diameter about 1-3500 of an inch and from 1-8000 to 1-10000 of an inch in thickness. They are concave on both sides so that their edges are thicker

than their centres and hence the dark appearance of the latter under the microscope which for sometime led observers to believe that they possessed a neucleus, but by their concavity the rays of light are reflected unequally, thus causing the dark spot in the centre. In their most perfect state they are of a uniform size and color. Being the heavier of the two are found from the laws of gravitation to collect at the bottom of the clot. When examined by the chemist the red globules of the blood consist of about 312 parts in 1000. They owe their color to a mixture of two compounds, globuline and hæmatine, the former of which on being separated crystallizes into various forms. These corpuscles perform important duties in our bodies, for possessing great powers of absorbing oxygen, they hurry away from the left side of the heart, and bear that life-giving stimulus to the tissues, takes from them, almost as readily, the carbonic acid, which, if allowed to remain would poison the whole body, carries it away and gets rid of it in the lungs where it again absorbs oxygen and again goes on its useful circuit through the body until following the laws which govern all cells and bodies composed of them they wear out, degenerate and die. The white corpuscles are greatly in the minority numbering often only one to forty or fifty of the red, they are of a light ashen appearance, circular, about 1-2800 of an inch in diameter, supposed to contain a neuclei. They are formed from masses of germinal matter thrown out from the lymphatic glands, indeed from all the ductless glands; thus appearing in the circulation as large, white, spherical, granular, neucleated cells, they go on in the process of development to form either the red blood globule or to form fibrine.

Whilst these three constituents are more generally shown by a rough analysis of the blood, there are yet, however, others which may be furnished by a chemical analysis, which may be given in such proportions as follows: Water 786. Globuline 126. Albumen 70.8. Fibrine 2.3. Saline Matmer 2. Hæmatine 5.4. These proportions are of course subject to variation, for we find the quantity of water to vary

with the moisture of the atmosphere, also with the amount taken into the system. The globuline taken together with the hæmatine are difficult to distinguish at all times in their proper proportion on account of the extreme difficulty of separating them from the cell walls, and hence the chemical nature of globuline has not been accurately ascertained save that it is soluble in water. Hæmatine has a peculiar scarlet appearance which is one of its characteristics and renders it distinguishable from other animal matter, in its impure state it is soluble in water and can be washed from the blood corpuscles from which it may be obtained by precipitation. Why the peculiar red appearance should be attached to hæmatine has by some been attributed to the presence of iron, but abundant chemical experiments have been given to afford sufficient proof that such is not the case, but that rather the constant changes of color taking place during the circulation of the blood is produced by the change of form of the corpuscles themselves. The amount of fibrine varies much with the state of the health, being much reduced by fevers and also less in venous than arterial blood. To the saline matter of the blood is due its alkalinity. Fatty matter abounds in the blood to such an extent as to compose nearly if not quite all of those found in the tissues and it is to the volatile portions of these fats that the odor of the blood is due; this constituent is more abundant after a meal in which meats have been eaten. After the formation of the blood we are naturally led to inquire as to how its growth and maintenance is effected. This appears to be kept up by a repeated production of new portions from the glands and by assimilation made like it. The perfection of this assimilation is truly surprising for every tissue has its ceaseless demands to make for the portion peculiarly adapted for its sustenance which nature provides for by the Forma tive Power.

Being thus developed and maintained into a perfect and healthy state, surely there must be some great purposes to be accomplished which may be reckoned as three: First, to

furnish to the body particles especially adapted to the nutrition and support of each portion. Secondly, to furnish oxygen to the various parts of the body. Thirdly, to bring from the various portions all debris.

ARTICLE III.

Notes from Dental Practice.

Calcified Pulp of a Superior Molar.

By James B. Hodgkin, D.D.S., Alexandria, Va.

In this case the patient, a lady, called with the left superior second molar aching, and so very sensitive, as to permit but little handling. The tooth had lost its antagonist, and had descended considerably below its fellows in the arch. The crown of the third molar lay against the posterior approximal surface of the affected tooth where the decay was situated so as almost completely to hide the cavity. The patient was very nervous from long suffering. The cavity was diseased as thoroughly as possible, and Welch's nerve paste applied, covered and secured by a pellet of cotton saturated with sandarac varnish, and the patient was requested to call again the next day. On her reappearance the sensitiveness and pain had much abated, but on attempting to excavate the cavity, some considerable uneasiness was manifested, and as the pulp did not appear to be devitalized, a second application of the nerve paste was decided on.

There seemed in the cavity some obstacle in the way of its ready entrance, the nature of which it was difficult to discover from the unfavorable location, as described. The application made as determined on, the patient was dismissed with instructions to call the day following. She failed to make her appearance however, at the appointed hour, and nothing was heard from the case until about ten days after she entered the office stating that she had been hindered from calling sooner on account of sickness. Pain had impelled her to seek relief, and as the tooth was found on examination to be in a bad condition,—acute periostitis with considerable inflammation of the surrounding parts,—it was resolved to

yield to her request, and extraction was resorted to. On breaking open the offending organ the cause of the difficulty in the way of a free entrance into the cavity was made man fest. The entire pulp, with the exception of a small investing membrane was calcified. The adherent portion or point from which the growth proceeded, was at the top of the pulp cavity, opposite the bifurcation of the roots. The uncalcified portion of the pulp very nearly completely invested the adventitious growth, and did not much exceed in thickness a sheet of ordinary letter paper. The case is sufficiently unique to excite curiosity.

A Singular Case.

A few days ago the writer was called on to extract the roots of a right inferior permanent molar, for a boy of 10 years. The crown of the tooth was entirely gone, there was considerable swelling about the jaw On examination of the extracted roots a large abscess was seen on the anterior root, and from the nerve canal at the apex of the posterior root a straw (a common broom straw) projected nearly one-fourth of an inch, the other end of the straw was broken off level with the upper or crown end of the root. The opening at the apical foramen was large and the roots both much blackened by necrosis. A very considerable haemorrhage followed.

A case a little unusual occurred also in the practice of the writer a few months ago. Patient, a lady with a necrosed lower incisor, the abscess from which discharged from an opening in the point of her chin, which was a long one. On extracting the tooth there was haemorrhage from this fistulous opening.

ARTICLE IV.

Replantation, Transplantation and Implantation.

Translated from the German for the American Journal of Dental Science

By Mr. O. Salomon.

Dr. Mitscherlich, Professor of Surgery in the University of Berlin, has written a Monograph upon this subject, and Dr. Suersen of Berlin mentioned something on the same subject at the annual meeting of the German Dentists.

In the first place to prevent misunderstanding, I will explain the difference between Replantation, Transplantation and Implantation. Replantation is to replace a tooth, after extraction, in the same alveola. Transplantation is the placing of a freshly extracted tooth from the mouth of one person into that of another. Implantation is the insertion of an old and dead tooth. Replantation and transplantation have been in use for a long time. The first successful implantation was performed by Prof. Dr. Mitscherlich who has also written a scientific paper upon the method of performing it.

Professor Dr. Mitscherlich presented to the Society of Medicine of Berlin (North Germany) a number of such patients. I have taken occasion to examine one of these patients before leaving Berlin, in order to be able to speak understandingly upon the "*status praesens*." The case was that of a young lady, for whom Prof. Dr. M. on the 2nd of March, 1861, implanted for one upper right cuspid, a second lower bicuspid. About eight years have elapsed and this tooth I am gratified to state, is firmer than any other tooth in her mouth. The color of the tooth remains unchanged, a circumstance very uncommon indeed. The soft parts around the tooth are perfectly healthy, and it has not the slightest appearance of chronic inflammation, suppuration, or anything of this nature. In the same mouth there is another implanted tooth by Prof. Dr. M. inserted a little later, the firmness of which is about the same as the first, but the color is of a somewhat dark violet. If any member of the profession desires to try the experiment of implantation, I advise him to open the pulp cavity, remove the soft, organic matter, and fill the same with gold. This will prevent the discoloration of the tooth.

In order to point out the physiological progress of this method of implanting teeth, Prof. Dr. Mitscherlich has tried a number of experiments upon dogs, and in only one case succeeded. He killed this dog to obtain a microscopical view of the tooth and part of the upper maxilla.

There exists two different opininions as to the progress of

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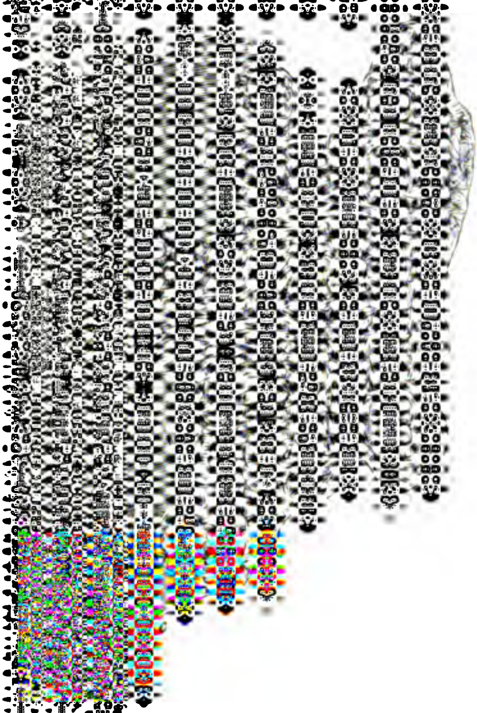


This cut represents a vertical section of a dead tooth implanted in a dog, and of the maxilla adjoining magnified 120 times.

a—Dentine.

b—New formed bone growing into the dentine.

c—Cavity of the reserved dentine.

d—Haversian Canals.

CORRESPONDENCE.

ARTICLE V.

Mr. Editor:—

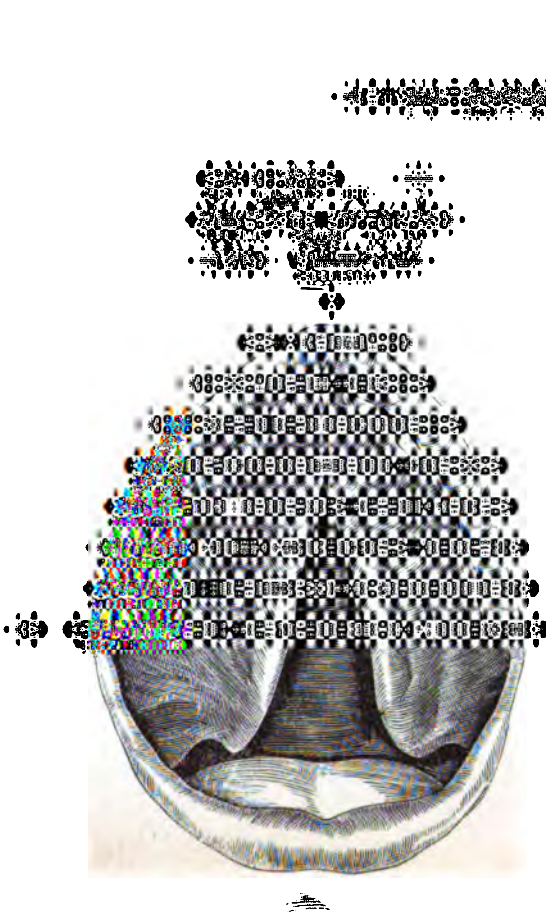
The Committee of Arrangements would respectfully inform the members of and delegates to the Dental Association, that they have effected arrangements with Messrs. Lelands for holding our meeting in Union Hotel Hall, Saratoga Springs, a splendid room admirably adapted for the purpose, which, together with a committee room, they have with their accustomed liberality offered us free of all expense during the day while we are in session. They also purpose to welcome us in a public Hall, which the committee have gratefully assented to.

The committee have also arranged for the accommodation of those who will give, say ten or twelve days notice to the chairman of the committee of their wishes, &c., at Union Hotel at $5 per day, and at Columbia Hotel (also kept by one of the Lelands) at $3.50 per day. The delegates with their families whether stopping at the Union or Columbia are to have the free use of the parlors and grounds of both Hotels.

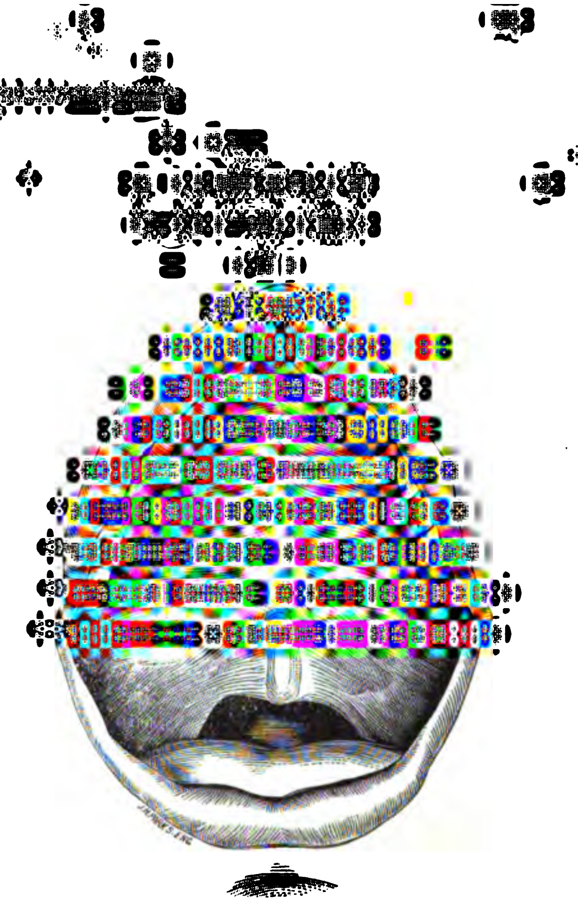
The committee have not been able to procure any abatement in the regular charges at these or any other Hotel in consequence of the time being their busiest season. Hoping this arrangement will meet the approval of all, we would express the hope that this will be the longest and most harmonious meeting the Association has ever held.

J. G. Ambler,
L. D. Rogers, Committee.
L. S. Straw.

25 West 23d St. New York.



Before the Operation.



After the Operation.

SELECTED ARTICLES.

ARTICLE VI.

*Surgical Treatment of Cleft of the Hard Palate, with an Illustrative Case.**

By Wm. R. Whitehead, M. D., New York.

Cleft of the hard palate has been regarded by most surgeons as beyond the resources of surgical intervention; and though numerous attempts have been made to establish the operation for this infirmity as a feasible and desirable procedure, yet not until within a few years has this much-desired object been attained.

In 1816, Græfe, of Berlin, was the first to attempt the operation for cleft of the soft palate, but was unsuccessful, and three years later Roux gave brilliant éclat to the operation known as staphylorrhaphy, by the happy success which attended his essay on the person of Dr. Stephenson, who read the report of his own case before the French Academy of Medicine, thus signally attesting the advantages of this triumph of French Surgery. Staphylorraphy then came in vogue with aspiring surgeons: its difficulties were more or less successfully met by ingenious-devised instruments. It had its glories and its defeats, the former being due to the more or less propitious circumstances which attended and succeeded its exact and skilful performance; and in this respect staphylorrhaphy, like some other deservedly well-established operations, has its serious disadvantages. After the first ardor, which its novelty had excited, somewhat abated, numerous objections were urged against it, and this operation declined in the favor of many. The operations for cleft of the hard palate shared a worse fate; and though Roux, Kreimer, J. Mason Warren, Pollock, and some others, met with a certain encouragement, yet the opinions of most medical men regarding operations for the closure of congenital or acquired defects of the hard palate have been strongly marked with

* This paper was read at a meeting of the New York Medical Journal Association February 19, 1869.

dissent; and at the present time the mechanical devices of the dentist are preferred to all operations for cleft palate of every description, by those who are unacquainted with the progress which has been made in this part of surgery. Heretofore there has been just reason to accept gladly any mechanical means, however imperfect, to supply the place of a confessedly tedious and long operation such as staphylorrhaphy. The emulous attempts of surgeons, to close, by operation, defects of the palatine vault, have met with but little encouragement, and this quite independent of a few, and I am happy to say only a few, who like to oppose any innovation which they imagine departs from their fixed and sometimes mistaken convictions, of which they appear more tenacious as they increase in years.

Gentlemen, I ask your indulgent attention to what I have to say about a German operation, and I believe I am the first who has endeavored to introduce it in this country. Many of you, I have no doubt, are familiar with Pollock's successful cases of cleft of the hard palate, and possibly some of you are acquainted with the attempts of Baizeau at restoration of acquired defects of the palatine vault. I shall not detain you with a consideration of the old modes of operating for cleft of the hard palate. It affords me pleasure, however, to remind you that to our honored and lamented countryman, J. Mason Warren, whose signal services in American surgery are respected at home, and widely esteemed abroad, is due one of the most remarkable and singularly successful efforts at closure of an extensive cleft of the hard palate. The direction and extent of the incisions in this case, as subsequently were those used by Pollock, resembled very much those adopted in the German method. But what particularly distinguishes this method is the inclusion of the periosteum within the flaps, with a view to the reproduction of bone. As you are well aware, the subject of the reproduction of bone from the periosteum has been well studied practically in our own city. The comparatively recent publication of the extensive works of Ollier and Sédillot has added fresh and much-increased in-

terest to this suggestive subject. The experiments of Flourens on the periosteum of animals were not lost to science, and some desirable applications to surgery have attested the value of those experiments. Never are we more forcibly reminded of the fortuitous distribution, by the winds, of different seeds falling on barren and fertile places, than in considering the accidental distribution of isolated scientific facts, which often seem of no use until beautifully developed by some fertile intellect. To Langenbeck we are indebted for an eminently useful application of the principles which Flourens had enunciated; to this Prussian surgeon is due a very successsful operation which, while it includes the periosteum in the flaps, with a view to the ultimate reproduction of bone to close the fissured vault, preserves the nutrient vessels uninjured, and thus contributes to success, by the avoidance of gangrene and sloughing of the flaps.

Thus far I have had but a very limited experience with this desirable operation, but I shall request presently to show you one of my cases which was recently operated on, and beg to call your attention to the one reported in the July number of the *American Journal of the Medical Sciences* for 1868, and which some of you saw at the meeting of this Association about a year ago, but before Langenbeck's method was essayed. I regret that the lady manifests some reluctance to appear here this evening, otherwise you would have an opportunity of seeing the very satisfactory result which has been obtained.

There is another case which has been operated on by me, an acquired defect of the hard palate, and which appeared to be a most favorable case for operation. In this case I signally failed, and I exhibit to you a plaster cast of it taken by a dentist for me before the operation. My failure was due principally to an exceedingly profuse suppuration; though I shall not attempt to exonerate myself entirely from the neglect to observe one or two little precautions in the performance of the operation, and which I have since learned to value more highly. Also I am more thoroughly impressed with the im-

portance of an entire eradication of the constitutional disease which sometimes causes the defect, before attempting an operation. In a case which came under my care a few days ago, caused by syphilis, I expect to assure myself as well as possible, by months of attentive observation, of the elimination of all constitutional taint before I operate. I propose this evening to give you only a general description of this new method of operating for cleft of the hard palate, and for more ample details I beg to refer you to an extended paper by me on this subject, in the October number of the *American Journal* for 1868. I shall not presume to repeat here verbatim that which is quite accessible to all of you who may desire to consult this article at your convenience; but I shall request permission to refer if necessary, to the woodcuts contained in it. I think that there can be fairly claimed for this operation advantages which entitle it to a prominent place in the list of useful operations. While I am quite sensible to the objections, some of which may with reason be urged against it, yet the undeniable advantages in its favor may justly claim your attention. In giving a brief history of the case which I offer for your inspection this evening, I shall endeavor to embody in it the most important points necessary to a comprehension of this operation, designated by the somewhat dissonant term, muco-periosteal uranoplasty. But previously I request your attention to the peculiar distribution of the arteries which supply the roof of the mouth. The descending or superior palatine artery, as you know, before emerging from the palatine canal, gives off a few small branches, which pass down the small accessory palatine canals, and are distributed to the muscles of the soft palate and mucous membrane. The superior palatine, in its horizontal portion, runs along in a groove at the junction of the horizontal plates of the maxilla and palate-bones with the alveolar process (see Fig. 1). Anteriorly

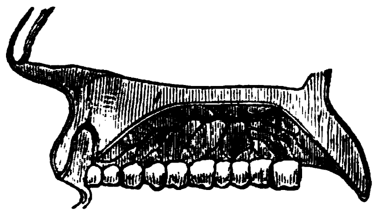


Fig. 1.

this artery passes through the anterior palatine canal upward to anastomose with the one on the opposite side and the artery of the septum nasi. The horizontal portion of the superior palatine is of considerable size, and is included in the periosteal flaps when they are detached from the bone. But these flaps remain adherent at their three nutrient points which correspond to the orifices of the spheno-palatine canals and the anterior palatine canal. The superior palatine is of considerable size, and if cut may occasion troublesome hæmorrhage. But this accident can be readily avoided by carefully detaching the periosteum with a blunt periosteal elevator. There is a little branch of the ascending palatine which, after passing between the tendons of the levator and tensor-palati muscles, is in relation with the inner border and posterior surface of the tensor-palati muscle, and the knife, in dividing this muscle during the operation to relax the velum palati, cuts this little branch, and nearly always causes some bleeding, but which, however, can be conveniently checked with ice-water spray thrown on the part.

There are numerous differences in the form, extent, and general appearance of cleft palates. They are very naturally divided into those which are congenital, and those which are the consequence of disease, as syphilis or scrofula, or of accident, the result of gunshot wounds of the mouth. After operations on the palatine vault, as in the removal of tumors of this region, or after resection of the upper jaw, the surgeon may be called upon to close, by operation, defects of the hard palate. The congenital defects are more or less familiar to you all. Most usually, the cleft does not extend

beyond the middle of the horizontal plates of the maxillæ. Very often the fissure is complete, and there is separation of the alveolar process in front; sometimes with a disfiguring projection of the intermaxillary bones. Occasionally there is a double cleft of the hard palate, complicated or not with double or single hare-lip. Exceptionally, there is seen a congenital defect of the hard palate only, and the soft palate is not split. Usually, however, whenever there is cleft of the former, there is complete separation of the velum. The cleft is quite often median—that is, occupying the middle of the vault; but, very frequently, it is more to the left. There are infinite varieties and degrees of this infirmity; but the operation, as applied to one of the not infrequent forms of cleft of the hard palate—such as that to which I now ask your attention—will suffice to illustrate the main features of the operation. But, on account of the very incomplete development of the lateral halves of the cleft velum in this case, the improvement in speech will necessarily be less marked than it would be were that development more considerable. But I do not wish to anticipate now what I have to say to you concerning the influence of this operation on the speech; and this is a point which should, and I feel confident will, engage your attention, as being one of the most attractive features of this German method.

Case.—Maria D., æt. 7, had a complete cleft of both the hard and soft palate. The cleft originally extended through the alveolar process in front, and was complicated with hare-lip, which last had been operated upon before I saw her, leaving an ugly-looking notch, which, however, can be readily closed. The cleft was five eighths of an inch posteriorly, and gradually diminished toward the front at the alveolar process (see plate). The deformity, as it appeared before the operation, is well exhibited by a plaster cast of the roof of the mouth, taken by a dentist previous to the operation, and which I offer for your examination.

On the 16th of last December, I closed the whole of the cleft by suture, most efficiently assisted by Drs. Louis Els-

berg, F. A. Burral, Octavius White, and Dr. Robert Newman. This last gentleman kindly administered ether. The operation was long and tedious, and required considerable patience.

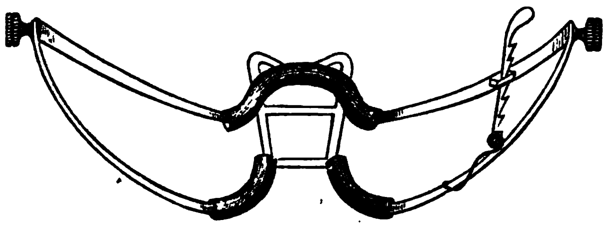


Fig. 2.

This stout wire gag (see Fig. 2), which I hold in my hand, was used to keep the mouth open during the operation. I think that this instrument is very well suited to many operations on the mouth, and has been much improved by the addition of a tongue depresser. The patient was placed on a sofa opposite a window, but the light was so dim that afterward artificial illumination was used.

After the administration of ether, the palato-pharyngeus, palato-glossus, and levator-palati muscles were severed, and the operation continued; but not until after the loss of considerable time from vomiting by the patient. There was also some delay occasioned in arresting the bleeding, and in washing out the throat with a spray apparatus.

The point of a sharp knife, curved on its surface (See

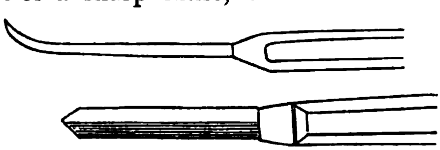
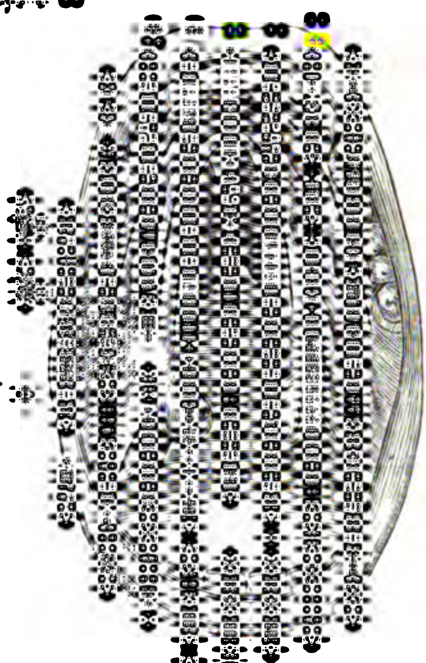


Fig. 3.

Fig. 3), was passed around and behind the hamular process, and over the lower part of the internal pterygoid plate, so as to cut loose the mucous membrane which confined each lateral half of the velum to this part.

If there had been a very perceptible ledge of bone, formed by the horizontal process of the palate-bone, it would have

[illegible] ds, to detach the [illegible] of this vestige of [illegible] nt precaution, as [illegible] they should after [illegible] d. This was the [illegible] ion, and is gener- [illegible] made along the [illegible] nark that, if there [illegible] along its edge, [illegible] st an eighth of an [illegible] superior palatine [illegible] he bone, and run [illegible]



[illegible] h side, which ex- [illegible] beyond the last [illegible] see A and B, Fig.

4, copied from Langenbeck). These cuts were made through the periosteum and to the bone.

Such extensive cuts may not always be necessary, and *interrupted side-cuts* have sometimes been preferred. For detaching the periosteum, I made use of an instrument like this (see Fig. 5)—

Fig. 5.

which Dr. Sayre facetiously calls his oyster-knife, and which he uses most advantgeously in detaching the periosteum in operations on the hip-joint.

Gentlemen, this instrument is far superior for this purpose to any periosteal elevator that I have seen, and much more handily used than that of Langenbeck, which I here exhibit:

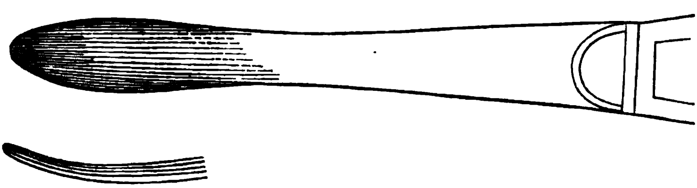


Fig. 6.

In detaching the periostoum, the nutrient parts of the flaps, to which I have alluded, were carefully respected; and after this stage of the operation was completed, the flaps almost met in the middle line. The paring of the edges was next done, and the passage of the sutures, seven or eight in number, was readily accomplished by means of this suture-needle—

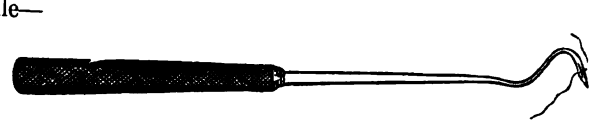


Fig. 7.

which I claim to be better than that used by Langenbeck or others in this operation. A silver-wire canulated needle

was essayed in this case for making one suture as on a previous occasion; but I prefer the needle which I have shown you as being more simple.

Some of the wires were twisted, and some of them were tied, as Sims's instrument, which I had made use of for adjusting the wires, had become misplaced, and could not be found until after the operation.

Bits of cotton were stuffed in the side-cuts, to keep them from healing too soon, and, also, by the pressure which they exerted on the sides of the flaps, to extend the line of union.

The hæmorrhage was quite abundant for a few minutes, but was readily controlled by means of ice-water spray. This bleeding came from the little branch of the ascending palatine artery, when I divided the levator-palati muscle. The bleeding which occurred in detaching the periosteum was very inconsiderable, as this membrane was torn off with the blunt edge of an elevator. In this respect the detaching of the periosteum in this manner guards against the hæmorrhage, which was formerly the accompaniment of *mucous* uranoplasty. On one occasion, my first uranoplastic operation, I cut the superior palatine artery, but controlled the hæmorrhage, without much trouble, by compression and the use of styptics.

Langenbeck states that, "in 14 cases in which mucous uranoplasty was done, there were six cases of dangerous secondary hæmorrhage; whereas, in 25 cases in which the periosteum was detached, there was no after-bleeding."

The patient was put to bed, and some strong beef-tea and other liquid food, as milk, ordered, as her only nourishment for ten days. There was no sloguhing or profuse suppuration following this operation. Spray containing carbolic acid was thrown twice a day into the side-cuts, into the throat, and through each nostril into the nose; great care was taken not to project the spray on the line of union. The cotton plugs were removed several times, and fresh ones saturated with glycerine put in their places. In the left side-cut some of the cotton remained much longer than I intended, and was not

discovered until all the sutures were removed. Most of the sutures were taken out about the 14th day, and the last ones remained until the 18th. The union was found complete all the way through (see plate): and the parts at present feels as if solid bone will ultimately be formed. This point however, I prefer to test a little later with a needle.

For making the side cuts, I used a knife like this:

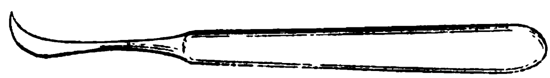


Fig. 8.

and for dividing the pillars of the fauces a sickle-shaped knife like this:

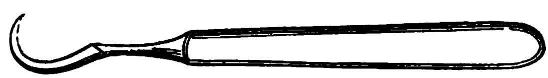


Fig. 9.

There is a brief analysis of 55 cases compiled by me and published in the *American Journal.* This analysis I have since reduced to a tabular form, which is prepared with some care, but I will not tax your attention by reading that which may seem unnecessary.

I shall content myself, therefore, with a short recapitulation of the most salient points of this analysis, and especially allude to those which I am sure will appear of most interest. Of these 55 cases collated by me, though they are far from representing the actual number of cases operated on, 47 of them were congenital defects. The remaining 8 cases were acquired deficiencies of the hard palate. Most of these operations were performed by Langenbeck and by Simon. I shall allude first to the cases of congenital cleft palate. Of these there were, of the 47 cases mentioned, 35 in which there was in each a complete cleft of both hard and soft palate. In 3 of these there was a double hare-lip—in 2 a single hare-lip—and in 5 a double cleft of the vault, one of which five cases was complicated with a double hare-lip.

There were 10 cases in which there was an incomplete cleft of the hard, and a complete cleft of the soft palate. In one case there was no mention made of the nature of the defect, and the remaining case was one of partial cleft of the hard palate without separation of the soft palate.

At first, and in some of the cases operated by Langenbeck, staphylorrhaphy was performed before uranoplasty; in fact, in 13 of the 47 case, staphylorrhaphy preceded uranoplasty. in 5, uranoplasty was done first, and in 24 cases uranoplasty and staphylorrhaphy were performed at one operation. In 5 cases uranoplasty alone was done. Silver sutures were used in only a few of the cases.

There were 33 cases of complete cure—9 cases in which the cure was incomplete, and 5 complete failures, one of them a death in a child 2 years old, from septicæmia on the 10th day, and operated on by Simon. But this is the only death ever attributed to the operation. In 4 of the 5 cases operated on by Beck, there was more or less marked improvement in speech, and in his 5th case, which was a very incomplete cure, we are led to infer that there was none. In two of his cases, he speaks of the nasal tone persisting. The three cases operated on by Billroth were on children. Two of these cases were failures, one of them an infant eight weeks old. The case which succeeded was of a child 28 weeks old; but nothing is said of the subsequent effects of the operation on the speech. Of 21 cases by Langenbeck, of which I have made an abstract, one was a failure, and there were 4 cases in which the cure was incomplete. Of the 16 cases out of 21 in which the cure is reported by him as complete, or nearly so, there are 5 cases in which he does not allude to the speech; in one of them, a woman 22 years of age, there was a good formation of bone. In another, a lad 9 years old, there was a very fine form of the vault obtained, but no new osseous formation. The three remaining of these five cases were youths of the ages of 9, 15, and 18. In 11 out of these 16 cases cured by Langenbeck, there was more or less marked improvement in speech. In some, the speech,

which was unintelligible before the operation, became intelligible and continued to improve. In some the improvement in speech was only slight, in others the speech became perfectly distinct. In a single case operated on in France, by Sédillot, on a child 3 years of age, there is nothing said about the speech; but the only object of this operator seems to have been to disprove that the periosteum alone can in this locality or elsewhere reproduce bone. In the 15 cases of congenital cleft of both the hard and soft palate operated on by Simon, the speech in 4 of them is reported by him as nasal and hard to understand. In 6 of the remaining 11 cases the speech was improved and made intelligible, but it remained more or less nasal. In the other 5 cases there were two of them in which uranoplasty alone was done, and the speech was not improved; in the other 3 cases either the hard or soft palate reopened or failed to unite, and the speech was about ths same as before the operation. In the case of my patient mentioned in the analysis, the speech, which before the operation was unintelligible, afterward became distinct and intelligible, but the nasal tone still persists.

We come now to acquired defects of the hard palate, the result of disease or wounds; and, of the 8 cases cited in my analysis, nearly all of them were attended with immediate restoration of normal speech. In order to examine thoroughly the advantages and disadvantages of this operation on the speech, it is proper to consider the influence of the velum palati on the modulation of the voice. Simon has most thoroughly studied this subject, and critically examined it. The persistence of the nasal tone, to which he has pointedly called attention, would seem somewhat to impair the usefulness of the operation when applied to cleft of the hard palate, involving a separation of the velum. There can be no doubt, that when the cleft is very considerable, and the two halves of the bifid velum are exceedingly small and undeveloped, there is not enough tissue out of which to construct a movable and serviceable soft palate, which shall even moderately

well supply the offices of a normally-developed velum.

The movements of the velum during speech cause the buccal and nasal cavities to communicate, or to be occluded from each other. When a complete occlusion cannot be effected, as in cleft palate, or from any other cause, such as the paralysis of the palatine muscles, temporarily resulting from diphtheria, more or less nasal tone must be the consequence. It is necessary, however, that a certain degree of nasal tone should occur in the pronunciation of certain words, in order to constitute purity of speech. If a nasal tone accompanies the pronunciation of nearly every word, as is sometimes even strikingly observed in persons who are not affected with cleft palate, the speech may be much marred; and, should it be characterized by an indistinct, harsh, and guttural articulation, I can conceive of nothing more displeasing to a person whose hearing has been cultivated to harmonious sounds. We know, however, that some persons who have a marked nasal accent have, nevertheless, a remarkably clear and distinct articulation. This is more perceptible in the French language than in our own.

Whenever cleft of the hard palate is accompanied with a wide separation of the velum, and when this last is not much developed, distinctness of speech may be obtained by the combined operations of uranoplasty and staphylorrhaphy, but the nasal tone will always persist, because the newly-formed palate will be too short, and the united velum too tense to permit at will the occlusion of the nasal from the buccal cavities. But distinctness of speech is a most desirable object to a person with cleft palate, whose articulation is unintelligible. Moreover, the most skillfully-devised mechanisms, of which I know none better than that of Kingsley, will not replace the permanent benefit which the operation of periosteal uranoplasty may afford to cleft of the hard palate.

Though this operation may be somewhat irksome to both the operator and patient, it is attended with very little danger to the latter.

The flowing downward into the throat and stomach of the nasal secretions is prevented afterward; and this is no inconsiderable advantage to those who are inflicted with such a repulsive infirmity as an extensive cleft of the hard palate. An obturator, with a soft-rubber velum properly adjusted to it, may admit of temporary advantages, but like some other mechanisms, it is only a make-shift, and is liable to become disarranged. It needs repairs, and requires frequent cleansing.

Obturators, in order to fit accurately, must be adjusted to the increasing size of each young patient's mouth, and every six months a new obturator may be needed. They are often sources of irritation; they wear the teeth to which they are sometimes attached, and frequently oppose the spontaneous closure or lessening of small perforations of the palate. These devices may be swallowed; in fact, in one instance death was the consequence of asphyxia from this cause. They are in some respects much like some of the artificial limbs which promise much and are at first very attractive both to the patient and to the surgeon; but these artistic wooden legs are after a while thrown aside to give place to crutches, or are availed of only on grand occasions, being designed more for show than for use.

Obturators, however, have their uses, and may sometimes advantageously replace the operation of muco-periosteal uranoplasty.—*New York Medical Journal.*

ARTICLE VII.

Varieties of Food—their Chemical Composition and Nutritive Value.

(Concluded.)

Meat—There is hardly a class of individuals, however poor, who do not make a strong effort to obtain meat. It would seem, therefore to be a necessary article of diet. In this metropolis the in-door operatives eat it to the extent of 14·8 ozs. per adult weekly; 70 per cent. of English farm laborers consume it, and to the extent of 16 ozs. per man

weekly; 60 per cent of the Scotch; 30 of the Welsh; and 20 of the Irish. The Scotch, probably, have a larger allowance than the English, considering that braxy-mutton is the perquisite of the Scotch laborer; but the Welsh have only an average amount of $2\frac{1}{2}$ ozs. per adult weekly; and the Irish allowance is still less.

It is difficult to obtain accurate returns of the quantity of meat consumed in London; but, if the computation of Dr. Winter be correct, it is not less than $30\frac{3}{4}$ ozs. per head weekly; or about $4\frac{2}{3}$ ozs. per day for every man, woman and child. In Paris, according to M. Armand Husson, who has carefully collected the *octroi* returns, it is rather more than 49 ozs. per head weekly, or just 7 ozs. a day. We are not therefore, such large meat-eaters as the French.

Butcher's meat differs very much in nutritive value according to the proportions of fat and lean; and there is a strong prejudice in favor of beef as the strongest kind of meat. In reality, however, the lean of all meat is of nearly the same nutritive power, provided it is digested; but in this respect there are large differences. The flavor also varies with the nature of the animal and its mode of feeding. Pampas-pig, and indeed most wild swine, are horribly rank, but by proper feeding they become delicious. In store animals, the proportion of lean is greater than the fat, and the solid matter does not amount to more than 28 or 29 per cent.; not so however, in fat animals, for then the fat is largely in excess of the lean, and the solid matters make up about half the total weight. The tendency, indeed, of the fattening process is to substitute fat for water in the carcass; and the quality of the meat depends on the intimate intermixture of fat with the muscular tissue. All animals are not alike in their methods of depositing fat, for some put it upon the surface of the body, and others accumulate it among the viscera. The art of breeding stock is to overcome both of these tendencies, and, at the same time to produce a fat which will not melt or boil away in cooking. Oily foods have always a tendency to make soft fat.

Lean meat is evidently deficient of carbonaceous matter, and this is best supplied in bread or potato; but in fat meat, considering that the nutritive power of fat is twice and a half as great as that of starch or sugar, the carbonaceous matter is often in excess of the right proportions; it is remarkably so in pork, which will bear dilution with the flesh of rabbit, poultry, and veal.

The amount of bone in meat varies; it is rarely less than 8 per cent. In the neck and brisket of beef it is about 10 per cent., and in shins and legs of beef it amounts to one-third, or even half the total weight. The most economical parts are the round and thick flank, then the brisket and sticking-piece, and lastly the leg. In the case of mutton and pork, the leg is most profitable, and then the shoulder.

Horse-flesh is hardly known in this country, except as canine food; but on the Continent, and especially in Germany, Belgium, and Switzerland, it is regularly sold in the public markets, and is considered by many persons superior to beef. Possibly we have often eaten it on the Continent without knowing it. A *chateaubriand*, or double beef-steak of Paris, is said to be the best of horse-flesh; and no doubt the frequenters of the *restaurants* of Paris have unwittingly acquired a fondness for it, and have relished it as good beef. A story is told by a writer in the *Saturday Review* of a Frenchman who blandly remonstrated with an Englishman for his scorn of French beef. "I have," he said, "been two times in England, but I navére fine the bif supérieur to ours. I find it vary conveenient that they bring it you on little pieces of stick, for one penny, but do not find the bif supérieur." "Good Heavens!" cried the Englishman, red with astonishment, "you have been eating cat's meat." To be serious, however, I do not see why the flesh of healthy horses should not be used as human food. It has, indeed, many powerful advocates, among whom is the great naturalist, Geoffory St. Hilaire.

Venison, and the dark flesh of other wild animals, differs from butchers' meat in the circumstance that it is leaner, and

that it contains more blood; but its nutritive power, when properly cooked, is not inferior to that of beef or mutton, and it is always more digestible.

The offal of meat constitutes about one-third of the entire weight of the slaughtered animal. It consists of the blood, the head and its contents, the tongue and brain, the heart and lungs, the abdominal viscera—as the diaphragm, the liver, spleen, pancreas, stomach, intestines, and reproductive organs, the feet, tail, and skin. In the case of the pig, the skin and head are parts of the carcass.

Nearly all these, when properly treated, are good for food. The blood of the pig is mixed with groats and fat, and converted into black pudding, which contains about 11 per cent. of nitrogenous matter. The stomach of the bullock is cleaned and boiled for tripe, which contains 13 per cent. of albumen and 16 of fat. The heart, lungs, and pancreas, which constitutes about 7 per cent. of the live weight of animals, are as nutritious as lean meat. The head, especially of the ox, makes good soup; but it requires long boiling to extract the nutriment. Boiled for eight or nine hours it will yield one-fourth of its weight in gelatine; besides which an ox-cheek will furnish about 4 pounds of good meat. Bones also contain much fat and nitrogenous matter, which they give up when broken small and boiled for many hours; 6 lbs. of bones are equal to 1 lb. of meat for nitrogen, and to nearly 2 lbs. of meat for carbon.

Bacon differs from fresh meat in the relatively large amount of fat and small proportion of water. It is an almost universal article of diet among the laboring classes. 74 per cent. of farm servants use it to the extent of from ¼ lb. to 2 lbs. per adult weekly. 69 per cent. of the Scotch use it, and 40 per cent. of the Irish. It is preferred to butchers' meat for many reasons—as that it goes further, especially with children, who don't generally like fat; it has more relish; it is easily cooked, and suffers less waste in cooking; besides which it is easily kept, and is always handy. Preference is nearly always given to the English bacon, notwithstanding

that it is double the price of American, for the flavor is better, and it does not boil away in cooking. No doubt the inferiority of American bacon is due to the method of feeding the pigs, for they run wild and eat large quantities of acorns, and oily nuts. Good bacon should not lose more than 10 to 15 per cent. in cooking.

The peculiarity of bacon is the large amount of carbonaceous matter it contains as compared with nitrogenous. Calculated as starch, it is as 20 or 24 to 1. Hence it is that it will improve the value of substances rich in nitrogen, as eggs, veal, poultry, beans, and peas.

Poultry and the white meat of rabbits are not of themselves very nourishing. They contain too much nitrogenous matter and too little fat. In the case of aquatic birds, as the goose and duck, the fat is more abundant; but it contains certain flavoring matters which are not easy of digestion. The darker flesh of game is also somewhat indigestible, and requires management in its culinary treatment.

Fish is not a favorite article of diet with the laboring classes, unless it is salted or smoked, and then it is chiefly used for its flavoring qualities. There is a prejudice that it has no nutritive strength, and it arises, perhaps from the circumstance that it does not easily satisfy hunger, and is quickly digested; but the inhabitants of our coast use it largely as food.

The white varieties of fish, as whiting, cod, haddock, sole, plaice, flounder, and turbot, contain only about 22 per cent. of solid matter, 18 of which is nitrogenous. They want butter, therefore, to increase their nutritive value.

Mackerel, eels, and salmon, are, however, richer in fat, for the former contains about 7 per cent. and the latter 6, while the oily matter of eels amounts to nearly 14 per cent. The same is the case with the sprat, the herring and the pilchard, and with most of our fresh water fish.

All fish are in their best condition at the time of the ripening of the milt and roe, for not only are they fatter at that time but when cooked they have a better flavor, and the flesh is

solid and opaque. On the other hand, when they are out of condition, the flesh is semi-gelatinous and watery.

Shell-fish of all descriptions have nearly the same nutritive values. They contain about thirteen parts of solid matter in the hundred, and this has the composition of white fish. Their digestibility varies—mussels, limpets, and whelks being rather hard of digestion, while scallops, cockles, periwinkles, lobsters, and crabs, are, perhaps, a little more easily digested, and oysters, are still more so. None of them are suited for delicate stomachs, although the poorer inhabitants on the coast eat them freely ; and vinyard snails on the Continent, and even slugs in China, have a reputation for delicacy and nutritive power.

Eggs contain about 26 per cent. of solid matter, 14 of which is nitrogenous, and 10½ carbonaceous or fatty. The yolk is the part which contains the fat, for it there amounts to 31 per cent., while the white of the egg, which is entirely free from fat, is the richest in nitrogen—the albumen amounting to 20·4 per cent. Altogether, however, eggs are very deficient of carbonaceous matter, for calculated as starch, it is only in the proportion of 1·75 to 1 of nitrogenous. Hence it is that eggs consort well with oil in salads, with fat bacon, and with all kinds of farinaceous matters in puddings.

Fat of some descriptions, as butter, lard, suet, or dripping, is universally consumed. In many cases it exists in sufficient quantity in the food, as in bacon and fat meat, but when this is not the case, it is invariably supplied from some other source. 99 per cent of farm laborers use fat of some sort—butter or dripping—to the extent of 5½ ozs. weekly per adult. It is difficult to say how much is really required by the human system, but looking at the proportion in milk, it would seem to be not less than 28 per cent. of the dry solid food. The fats in common use contain about 80 per cent. of real fatty matter, the rest being water and salt, and although butter is the fat ordinarily purchased, yet dripping is equally valuable, and so also are the vegetable fats of the tropics, Cocoa and chocolate owe their chief value as food to the fat

they contain. Cocoa is composed of 50 per cent. of solid fat, called cocoa butter, and chocolate is a sweet preparation of it.

Of liquid articles of diet, beer and porter stand first in nutritive value. They contain about 9 per cent. of solid matter, 8¾ of which are sugar and gum. Their nutritive value is not, therefore, great; and yet according to Liebig, whenever beer and porter are not used, there is always a larger consumption of bread.

The nutritive functions of tea and coffee are hardly understood; for although they are largely used, and as if by an instinct craving, yet their actual nourishing power is insignificant. I shall deal further with this subject hereafter.

The last constituent of food that we have to consider is saline matter. Broadly, it may be stated that we require phosphates and sulphates of potash, lime, and magnesia, and that we also want a still larger proportion of common salt. In most cases the phosphates and sulphates are in sufficient quantity in ordinary foods; in fact Mr. Lawes found, in his experiments on the fattening of animals, that for every single part of saline matter retained in the system of the pig, there were from fourteen to fifteen parts in the food; not that the whole of this was lost, for probably it performed important functions in the process of assimilation and secretion. Common salt, however, is not present in the food to any large extent, and therefore it must be added to it.

And now, before leaving this part of the subject, let us pause to consider the vast machinery which is in operation for the supply of food to this metropolis. At the present time over three millions of people have to be fed daily; and yet so regular is the supply, that no one considers even the possibility of its failing. On the other hand, there is no redundancy; and not only does this supply regularly reach the metropolis, but it is distributed to our very doors. About 4,200 tons of fish; over 4,000 sheep; nearly 700 oxen; about 90 calves; 4,000 pigs, including bacon and hams; not less than 5,000 fowls and other kinds of poultry; besides a mil-

lion or so of oysters; and eggs innumerable, with flour enough to make nearly a million quarten loaves; and vegetables, butter, and beer in proportion, are daily brought to this city. "Imagine," as Archbishop Whately says, "a head commissioner entrusted with the office of furnishing all these things regularly to the people. How would he succeed?" And yet all this goes on with the regularity and precision of machine, without Government or even municipal interference, but simply through the magical power and unfettered action of free-trade.—*Druggist Cir. & Chem. Gaz.*

ARTICLE VIII.

Clasped Plates.

Professor Smith at a recent meeting of the "Pennsylvania Odontographic Society," thought the subject under con sideration "The Relative Merits of Clasps and Atmospheric Pressure for Retaining Partial Plates," to be one of great practical importance, affecting as it does the appearance and comfort of a very considerable number of patients, while often taxing the skill and jeopardizing the reputation of the dentist. A matter of so much moment demands careful study, and requires that in forming conclusions, we be assisted by sound judgement and practical experience. Very opposite opinions have been expressed this evening as to the efficiency and utility of the different modes of applying partial dentures—some claiming that in no case can an artificial piece be retained in the mouth by other means than atmospheric pressure, without positive injury to the natural teeth; others giving as the result of their trials that from one to three of the oral teeth inserted without the aid of clasps, cannot be retained in the mouth during the process of mastication. Speaking from his own observation, he could not acquiesce in the views presented by either side. He would go neither to the one extreme nor the other, but stand upon middle ground; this he believed most emphatically a tenable position, sustained by facts and the teaching of everyday

practice. While in most cases his preference would be fo. suction plates, yet he unhesitatingly discarded the theory of of necesitated and positive injury from every form of clasped denture.

English dentists, for more than half a century, have used partial plates clasped, almost exclusively; their testimony is not such as to lead to utter condemnation, but rather to a continuance of the usage. Much injury has unquestionably been done to the natural teeth by clasps; but he believed that in almost every instance it could be directly traced to the neglect or want of cleanliness on the part of the patient; to the injudicious selection of natural organs to which to apply them; to the improper form of the support, or the want of adaptation. If our American students were as thoroughly schooled in the manipulations pertaing to dental mechanism as the English are, he beleived far less mischief would be observed from clasped plates. There is too great a tendency to confound as synonymous in these days of the reign of cheap materials, the ability to adjust a set of suction teeth on a base of rubber, and mechanical dentistry. It is here, in a want of knowledge of the principles of mechanical dentistry, that we find the source of evil from clasped plates; just in proportion as we understand these principles, and by nice manipulations are able to put them in practice, will we diminish the injury to the natural teeth from the use of bands. This style, when well adjusted, will need a clasp only to steady it; its *main* support being from accuracy of adaptation to the parts upon which it rests. Often, very often, plates are formed and clasps adjusted in such a manner as to compel them to do *all* the work of sustaining the piece. Where such is the case, detriment to the natural organs must be the result.

Classes of teeth entirely unsuited for such a purpose are not infrequently selected as supports for partial cases. He had often seen clasps about the cuspid teeth, and in one or two instances about central incisors.

That a clasped plate necessitated the absorption of the

processes about the natural teeth more than a suction plate would do, he believed to be without foundation in fact. In regard to a clasp about a natural tooth interfering with its normal condition, as a string embracing muscular tissue interfers with its functions, he thought we had no evidence to justify us in concluding. The damage which is done to a tooth he conceived to be purely external, and when the plate is properly formed and the clasps nicely adjusted, there is little danger from this source. A marked want of attention to the cleanliness of the piece, assisting the mechanical action of the clasp, may be, and doubtless is, a prolific source of harm.

While he believed the clasping of partial cases, in the present condition of dental prosthesis, to be decidedly *good* practice, he nevertheless discarded the views that suction plates cannot be made to answer where the teeth had no antagonists. He felt no hesitation in inserting from one to six oral teeth on suction plates, when such a course seems most in harmony with the requirements of the case; had a number of such in his own practice, and had seen them from the hands of various gentlemen in the profession.

An objection urged against suction plates for partial cases, was the difficulty of obtaining a perfect impression in wax. He recommended plaster; where there is a liability of displacing the wax in withdrawing from the mouth, it is the material to meet the demands; it does not draw but breaks, and in such a manner as to preclude the possibility of getting it into any position but the correct one when adjusting the broken pieces. The cup may be detached from the plaster in the mouth, then cut, if hot, so as to break in a manner to best facilitate removal. One of the most valuable properties of plaster as an impression material is its quality of resisting displacement, when set, without breaking. With plaster, as perfect an impression of the mouth can be obtained for a partial as for an entire case.

In regard to chambers, he was satisfied that the very best form of suction plates were those without them; as com-

monly made they are too deep. A shallow cavity is far more efficient than a deep one, as the part is only put upon the stretch, while the deep is soon filled, often with an indurated mass, which renders it worse than useless. Professor Smith called attention to the spring plates patented by E. B. Goodall, of New Hampshire, and explained the manner of constructing them. Objection being raised to this method because of the patent, he confessed his inability to understand why a professional man, simply because he is such, should be debarred from protecting an invention by legally obtaining a patent, while the mechanic is applauded for such a course.

He considered mechanical dentistry, so called, by far the most perplexing department of dentistry, requiring for its intelligent practice an extended range of experience and information. He hailed with open arms any discovery or invention, patent or otherwise, that would assist in securing more certain and satisfactory results than have yet been reached in this branch.

ARTICLE IX.

Fungous Tumor of the Fangs of a Molar Tooth, Diagnosed and Treated as a case of Menoplania.

By GEO. SYNG BRYANT, M.D., Lexington, Ky.

Miss—, æt. 16 years ; a blonde ; tall, thin and pale; skin of a chlorotic cast. Has suffered much from palpitation of the heart and indigestion ; appetite has usually been depraved for several months past.

Prior to the last eighteen months this young lady had been healthy and ruddy ; but being ambitious to outstrip her classmates she gave herself up to arduous study and soon her health began to fail. She did not, however, relax her efforts at the school-form. Periodical headache, attended sometimes with sick stomach, would compel her to leave the school-room and retire to bed ; these attacks lasting from 24 to 48 hours.

At fourteen years of age the catamenial eruption took place and continued regular and normal for about nine months; then became irregular and scanty, and finally ceased altogether. About the time of the cessation of the catamenia the headaches grew worse and more frequent and were usually attended with an uneasy sensation, or slight aching of the second lower molar tooth of the left side. After a few weeks, the head symptoms and toothache became so much worse that continuance at school was impossible.

The tooth being apparently sound, the physician in attendance, regarding both the tooth and headache of neuralgic character, and dependent upon close confinement and hard study, put the patient upon tonics, and advised exercise in the open air whenever practicable. It was observed that the bleeding from the gums of the affected tooth was assuming a periodical tendency. The physician believed this hæmorrhage to be an example of vicarious menstruation, and the case attracted much attention. Being called in consultation, I learned the above history, substantially, from the family physician. It was evident, to my mind, that the young lady was laboring under a chlorotic amenorrhæa, with great impairment of the nutritive functions, which, in this case, was probably the primary etiological element of the chlorosis and amenorrhœa. Upon close inspection of the affected tooth, I discovered some enlargement, and slight inflammation of the gums around it. Being fully persuaded that this was a case of disease of the fangs of the tooth, accompanied with periodical hæmorrhage, and that it was not a case of menoplania, I advised that the tooth be extracted immediately, and the patient put upon treatment suited to her amenorrhœal and chlorotic condition. This opinion was opposed by the attending physician and another present in the consultation. Upon being sent for again, in in the course of two weeks, I urged the pulling of the tooth which was consented to, and on the following day the tooth was extracted by a skillful dentist. Both fangs were found

affected with a fungous tumor—one the size of a small pea, and the other not as large. I need scarcely add that the hæmorrhage never returned, the headaches grew less frequent and severe, and in a few months the attenuated, nervous young sufferer was fully restored to health.

May not many of the so-called examples of vicarious menstruation be only cases of amenorrhœa, complicated by other diseases.—*Richmond and Louisville Med. Jouraal.*

ARTICLE X.

Atmospheric Pressure Over the Alveolar Ridge.

By W. George Beers, Montreal.

In spite of the most perfect impressions and every possible precaution, it is not uncommon to meet with rubber upper sets which drop down at the front of the mouth, in ordinary conversation. No size of palatine air chambers seem to obviate the difficulty, and if adhesion is obtained at all, it is after considerable time, *and a perseverance* on the part of the wearer, which the majority of patients do not possess. We have had our share of trouble with these cases, and particularly of late. One case was that of a lady whose alveoli had absorbed with but little accompanying absorption of the gums. The latter remained soft, though healthy to all appearances, and two years after the insertion of the set of teeth there was no perceptible change. The set gave way in front, and dropped. The other case was that of lady wearing an upper set made by a confrere, which he had perseveringly renewed three times in hopes of securing adhesion, but to no avail. The gums in this instance were hard, and the alveolar process rather more absorbed than usual—the front part being less than the sixteenth of an inch above the level of the palatine bones. We take these two cases as extremes of a condition of gums and alveoli, to which artificial sets are difficult to adapt.

In both these cases, as in all others which we afterwards tried, the sets were wholly completed; and the following

remedy was only used and is only recommended as a *dernier resort* in cases where sets drop.

In addition to the palatine air-chamber, we cut four separate round vacuums in the rubber immediately over the part which touched the alveolar ridge when the set was in mouth. Commenced at the second bicuspids on both sides, and ended back of the centrals: the holes a little more than the ordinary depth of an air-chamber.

The result in every case so far has been almost immediate atmospheric pressure, and adhesion of the sets at the very point where they dropped. When the air was exhausted from the mouth, the suction was almost immediate; and by this means we have succeeded in obtaining perfect suction in several cases which previously were failures. In none of these cases has the mucuous membrane been rendered sore by being drawn into the vacuums, though we make our patients provide against this, by leaving their sets out for awhile, during the night for instance, if the gums are at all tender.

We object to air-chambers in vulcanite sets if they can be dispensed with, but there are difficult cases now and then when even the ordinary palatine chamber is insufficient.

Would some of our friends who meet with difficult cases of the kind, try the means here suggested, and report to the *Journal.* We are aware that vacuums have been made over the alveolar ridge of the inferior maxillary for lower sets, but we never heard outside of our own experience of the application of atmospheric pressure principle to that of the superior maxillary.—*Canada Journal of Dental Science.*

MONTHLY SUMMARY.

Imperfect Enamel.—Dr. S. P. CUTLER says: Furrowed enamel is not always an indication of bad taint in blood of an hereditary nature. Not long since a young lady called on me to have her teeth examined. There were some few decays, with this exception all of her teeth were perfect, except the lower front and lateral

in cisors of the left side, which were both cross-furrowed deep into the enamel, some three or four grooves in each, and otherwise not well developed. She informed me that two corresponding deciduous teeth were knocked out when she was about four years old. high respect. This statement settled the rising suspicions in my mind. The ability of the party should of itself have done away with all doubts, even without any knowledge of the case.

The above case goes to establish beyond any reasonable doubt the connection existing between the first and second sets of corresponding teeth, showing the importance of retaining the deciduous teeth up to the eruptive stage of their respective successors, and that too, in a healthy condition.

The above case also shows conclusively that the nutrition of the crowns, especially the enamel, was disturbed to a considerable extent by the accidental loss of the deciduous teeth at too early a stage; had they been retained two years longer, no defects could have existed in the two permanent teeth referred to.

The importance of not only retaining the deciduous teeth up to the full period when nature makes provision for their leaving, by root absorption, as well as their healthy preservation, cannot be too highly estimated.—*Dental Register.*

Arkansas Stones.—Oil or Ouichita stone is the material from which are manufactured the oil stones used for giving a fine edge to edge tools. This stone is found in Arkansas, the quarries being situated near the celebrated Hot Springs of that State. The stone is quarried with great care into blocks of from two to four feet square, or of irregular shape, according as it lies in the quarry. From the Hot Springs it is shipped to Little Rock, where, at the present time, it is sold at the rate of three cents per pound in the rough, the purchaser being charged with all the expenses of its shipment from that place.

The white stone comes from the same quarries as the oil stone, but from a different vein. This stone is much more costly, and of a much finer grain than the oil stone. It is used by jewellers, engravers, and manufacturers of surgical instruments, used and manufactured by them. It is also used for sharpening sewing machine needles, and all delicately pointed instruments, for sharpening the instruments it is better and is much more costly

than the oil stone. We believe that the quarries at the Hot Springs are the only ones producing the oil and white stone in America, and they have proved an immense fortune to the proprietors.

There are in America but five manufactories of oil and white stones. One is at Jeffersonville, two at New York, one at St. Louis, and one at New Albany. The manufactory in this city is more extensive than all other four combined, and purchases more stone and turns out more product than the other four put together.

Its annual product, is of Ouichita or oil stones, one hundred and five thousand pounds, and of white stones ten thousand pounds, and Hindostan stones one hundred and eighty thousand pounds. The value of this product is immense. The Hindostan stone comes from a quarry in Orange County, Indiana. To give an idea of the value of white stone, we will state that we are informed that seven thousand of the sewing machine whetstones were recently shipped to Albany N. Y., in a little box eight inches long, eight inches wide, and eight inches deep, for which $70 per thousand were paid, or $490 for the contents of this one little box.—*Sc. American.*

Strength of Carbolic Acid Solutions.—In view of the fact that carbolic acid is now largely in use in medicine, with a probability that its range of application will be increased, it is well for prescribers to be very careful of the particular preparation they employ. Instances are reported where much damage has been done by the external application of this substance in solution, the prescriber not knowing the exact strength of the solution, and we ourselves have seen carbolic acid ordered from the apothecaries, in such a way as to evince plainly the fact of a most blissfnl ignorance of whether the medicine was solid or a fluid, or in what proportion it was proper to use it. Dr. W. T. Channing, of Providence, reports to the Boston *Journal of Chemistry* several cases of serious results, from the use of the concentrated fluid acid, which is dispensed by some under the name of "solution carbolic acid," when the prescribers intended only a milder solution, which they had been in the habit of using, but had obtained it from other druggists. Until, therefore, some distinctive nomenclature shall be given to the various preparations

of this substance, and some officinal "solution" shall be decided upon, physicians cannot be too careful in learning the strength of the solution employed, and it would be advisable to give explicit directions where to procure it.—*Med. & Surg. Reporter.*

Antidote to Carbolic Acid.—Dr. CRACE CALVERT states that in poisoning with this acid, the best antidote, after the stomach pump, is large doses of olive or almond oil, with a little castor oil. Oil is a solvent, and consequently a diluent of carbolic acid, and may be used to stop the corrosive effect of the acid when its action on the skin is too violent.—*Journal of Cutaneous Medicine.*

BIBLIOGRAPHICAL NOTICES.

Atlas Zur Pathologie Der Zahn, Bearbeitet Von Weil. Prof. Dr. M. Heider und Prof. Dr. C. Wedl.—Die Zeichnunger Sammtlich Nach Der Natur Aufgenommen Von Dr. C. Heitzmann. Dritte Lieferung. Leipzig: Verlag Von Arthur Felix.

Atlas to the Pathology of the Teeth. Arranged and explained by the late Prof. Dr. M. Heider and Prof. C. Wedl. All the drawings are taken from nature by Dr. C. Heitzmann.

Part I and II of this interesting work have already been noticed in the May No. of the *Journal*, and we have now before us another number. Part III contains four fine lithographic plates, representing thirty-two pathological specimens of enamel, dentine and cementum accompanied with explanatory notes in English as well as in German. One more number completes the volume which will prove a valuable addition to the library of the dental practitioner.

Proceedings of the State Medical Society of Michigan for 1867-68. —These "Proceedings" contain many interesting reports on various subjects connected with the practice of medicine and surgery, and may be read with profit.

Half Yearly Compendium of Medical Science.—S. W. Butler, M. D., Philadelphia. The great value of this work is so universally acknowledged by the members of the medical profession that we need not dwell upon its merits. The dental practitioner who wishes to keep himself posted in medical literature will find no better instructor than the "Half Yearly Compendium," The contents of each number consist of Anatomy and Physiology, Physics, Botany, Chemistry, and Toxicology, Materia Medica and Therapeutics, General Medicine, Clinical Medicine, Obstetrics, and Diseases of Women and Children, and Surgery.

EDITORIAL DEPARTMENT.

* The Ninth Annual Meeting of the American Dental Association, will be held at Saratoga Springs, N. Y., commencing Tuesday August 2nd 1869, at ten o'clock A. M.

The following form of certificate was adopted at the last meeting of the Assocication.

This certifies that ——— was duly appointed a delegate to the American Dental Association on —— day of —— and that said ———is a Dentist of good character and standing, and at this time in regular practice.

No delegate will be admitted without he answers the requirements of this certificate, which he must bring with him, and present in person.

Accommodations will be secured for those giving early notice to Dr. J. G. Ambler, No. 25 West Twenty-third St., N. Y. City.

There is reason to anticipate a profitable and enjoyable session and it is hoped that representatives from evey local society in the United States wil be present.

JAS. MCMANUS,
Cor. Sec. American Dental Association.

Hartford, Conn.

The Mallet vs. Hand Pressure.—From the Proceedings of the "Massachusetts Dental Society" we have the particulars of an interesting trial to determine the difference of density between mallet-force and hand-pressure.

The operators were Drs. Wetherbee and Salmon, and the trial was conducted in the presence of a committee, appointed for the purpose, consisting of Drs. McDougall, Codman and Whitechurch.

An ordinary steel draw-plate had been provided. It was placed on a block of wood the size of a man's head, weighing six pounds. One end of the plate was covered on one side with a piece of copper covering the hole to be filled, which was the centre hole at the end nearest the right hand; the large or funnel end of the hole was placed upward, and the work commenced.

Dr Salmon, who led off, "struck the first blow" at eleven minutes to eight. He had previously provided himself with three of his automatic mallets of the latest make, and which he stated were the same as he had just used for filling a crown cavity.

The foil used was No. 3, and the rolls were each made of half a sheet: Dr. McDougall annealed the foil. Dr. Codman acted as Secretary, while the others amused themselves in various ways, and the "rappings" were loud and "spirited" at the table where Dr. Salmon sat.

* This communication was received too late for its proper place under Correspondence.

The number of blows on the first piece were not counted; the second piece received 130 blows; the next 180; from that number up to 275, as the circumference of the hole increased, which was the largest number counted. The cavity was filled more than full, rounded up, burnished, and filed off even with the plate; then finished at the bottom and top, and driven out of the plate. The time taken was one hour and eight minutes.

Dr. Wetherbee then took his turn. The number of thrusts or hand blows was rather more during most of the filling than the blows of the mallet, ranging from 171 to 318, as the highest number, to the half sheet, though the secretary observed that less hand blows were given than mallet blows for the final condensation. The time was a few minutes longer, being one hour and thirty-four minutes, which included some resting spells. The filling was then finished as before, driven out, and the difference of the two weighed.

The size of the hole and filling at its smallest diameter was No. 11 of the wire gauge. The amount of foil used was a trifle over ⅛ oz.

The weight of the fillings finished was—Dr. Salmon's with the automatic mallet, 28 grains; Dr. Wetherbee's with the hand pressure, 24 grains; difference in weight 4 grains.

The committee believe the trial to have been conducted with perfect fairness in all particulars. The blows and pressure were heavy and greater than is usually used in filling teeth, and, as the committee believe, more than is generally practicable. If any advantage existed, they think it was in favor of the mallet operator, as, the hand pressure being exerted in a different position from usual, the instrument rested in an unusual position, and chafed the hand of the operator, making it sore even to blistering. We estimate that nearly or quite five thousand blows were given to each filling.

Chromic Acid.—Dr. E. Magitot in *Bulletin General de la Therapeutique*, advocates the use of *chromic acid* in various affections of the mucous membrane of the mouth, such as general and ulcerative stomatitis, gingivitis, aphthae, &c, For alveolo-dental periostitis this writer specially recommends it as having a rapid and beneficial effect.

Chromic acid is prepared as follows: To 100 parts, by measure of cold saturated solution of bichromate of potassa, 150 parts of pure sulphuric acid are added and allowed to remain till cool; the sulphuric acid unites with the potassa, and the chromic acid crystallizes in deep red needles—very soluble and deliquescent.

It possesses powerful oxidizing and bleaching properties, and acts as a solvent of organic matter, in view of which it is necessary to use it with caution, Its principal use in medicine is a

caustic application care being taken that it does not spread beyond prescribed limits, as there is no danger of its doing when properly managed. When used as a caustic, as soon as its corrosive action is finished, it passes into the state of inert pulverent sesquioxide.

When applied to mucous membrane it should be diluted with two or more parts of water; in this proportion it has been successful in arresting uterine hœmorrhage.

Injunction Against the Boston Dental College. From the *Boston Herald* of June 14th we learn that Judge Ames issued an injunction on Saturday upon the officers of the Boston Dental College restraining them from granting the degree of Doctor of Dental Surgery to students of three years pupilage who have not attended two full courses of lectures, said courses to cover two full years, as understood at Harvard and other medical and dental colleges. The injunction was issued at the instigation of six members of the Board of Trustees, viz., John P. Ordway, Eben D. Jordan, Ammi Brown, I. M. Daly, Isaac Ayling and J. B. Coolidge. A hearing was to have been held on Saturday, June 19th, to see whether the injunction shall be made perpetual.

Frightful Wound of the Skull; Recovery.—Dr. A. C. Folsom in the *Pacific Med. & Surg. Journal*, describes an extraordinary case of recovery from a frightful wound of the skull, resembling the famous tamping-iron case of Dr. Harlow, published in August No. 1868 of this Journal. The accident resulted from a circular saw, the cut extending from the root of the nose to the occipital protuberance, and being nine inches in length in the bones and eleven inches in the scalp, and three inches deep. The bones of the skull fell apart over an inch, and the membranes as well as the substance of the brain were divided. Thirty two minute pieces of bone, together with considerable sawdust were taken from the wound, also a table-spoonful of the substance of the brain, and the saw must have removed as much more. Dr. Folsom saw the case half an hour after the accident and found the pulse 74, full, soft and flowing. The patient was perfectly conscious, free from pain, and the hæmorrhage slight. He thought himself able to walk, and could not tell when the brain, its membranes, or the walls of the cut were touched, even when pressed upon with considerable force. He was sensible when the scalp wound was touched. After removing the hair and cleansing the wound, the edges of the cranial bones were gradually and carefully drawn together with a common tourniquet, the wound in the scalp requiring six stitches. Adhesive plaster completed the dressing. The patient was dismissed after daily attention for three weeks, and at the end of five or six weeks from the date of the injury he resumed his business.

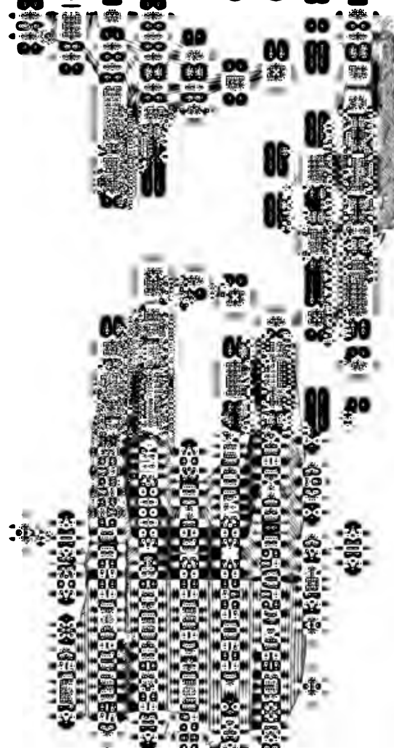


FIG. 3.

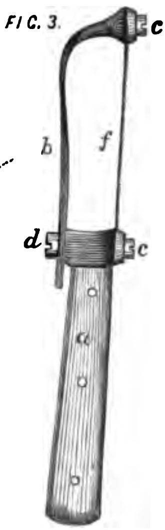
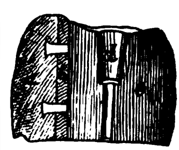


FIG. 5.



E DRAWINGS.

n line, through a superior central e and a pivot tooth b attached.

f fang. b, Porcelain tooth with pins. hich is soldered to the tooth and to pex of fang. f, Filling around the c resting on the edge of the tube. by the margin of the gum.

a, Handle of instrument. b, Spring ped. d, Screw by which the spring

A first superior molar, magnified: n crown, according to Dr. Maynard's ty and canals filled with gold. c, crown is secured to base. e, e, Cav- f, Ring of gold filled into the junc- n and base.

buccal surface of porcelain to a gold g, b, and this soldered to the gold

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ARTICLE I.

Pivot Teeth.

By James B. Bean, D.D.S.,M.D.

Those teeth which are supported by the inter-maxillary bone, which receive their nourishment from a branch of the infra-orbital artery, and are supplied from the anterior dental branch of the infra-orbital nerve, seem to be endowed with a peculiar vitality of their periosteum that enables them to be retained with impunity in the mouth after the destruction of their lining membrane, and even after they have been deprived of their crowns, and reduced to a level with the gums by filing or by caries. This peculiarity of the anterior teeth is of very great service, as it enables the dentist to supply the deficiencies so often caused by destruction and decay of these teeth, after proper preparation of the fangs, in the most perfect manner, and to secure to the patient a substitute almost as useful as was the lost organ, and often more beautiful and pleasing in appearance.

The number of cases, however, in which artificial crowns can be attached to natural roots of teeth with entire success and permanent usefulness to the patient, are limited. Nevertheless, there are many cases in which this is the best possible manner in which we can supply the loss of these organs.

The utmost resources of our art, therefore, should be brought to bear in producing a substitute that will give such entire satisfaction as a properly constructed *pivot tooth.*

In the cases for which we are called to operate, the crowns of the teeth under consideration have either been destroyed or disfigured by mechanical violence, or have been corroded by caries to such an extent that restoration by filling with gold would be impossible, or at least inadmissible. In the first class of cases, if the accident has not produced contusion of the periosteum, and consequent loosening of the tooth, and the fang has not been fractured below the margin of the gum, the operation may be performed at once, with the most complete success. And sometimes, after considerable inflammation of the periosteum, and consequent loosening (where the concussion has been severe), the tooth will in a short time become sufficiently firm in its socket to warrant the success of the operation. The second class is of more frequent occurrence, and if the teeth yet retain their vitality, and are firmly fixed in their socket, surrounded by a healthy gum and periosteum, the chances of success are most favor able, and, if proper pains be taken, the best results will follow.

The peculiar advantages claimed for pivoted teeth, are, that they can be immediately applied without the usual delay dependent on the absorption of the alveolus, and without encumbering the mouth with plates, clasps, &c., while at the same time they are much firmer, and more useful in the mouth than plate teeth.

The facility with which this operation may be performed has caused it to be resorted to by many unskillful practitioners, under the most unfavorable circumstances, by reason of which, it has gone into disrepute with many intelligent dentists. Yet the best operators, and the most eminent dentists who have ever graced the profession have given it their sanction, and says Prof. Harris, "It is certainly the best method that can be adopted for replacing the loss of the six upper front teeth."

Many different methods have been proposed for the attach-

ment of artificial crowns to roots of natural teeth, but before attempting any of them, certain preparations and precautions are necessary. The favorable indications already enumerated should be present if possible, and all diseased action in other parts of the mouth should be corrected by the removal of all old fangs and such diseased teeth as cannot be restored to a healthy condition, and the gums and living membrane of the mouth should be freed from all abnormal conditions by the removal of exciting causes, and the use of the proper remedial agents indicated. Moreover, the patient should have a sound constitution, free from any cachectic habit that might be prejudicial to success

The method of fastening crowns of natural teeth to fangs in the mouth by means of pivots or tenons of wood, was practiced in the remotest antiquity, and has been described by the oldest dentists who have written on the subject of artificial teeth; and Bourdet, who wrote in Paris more than a hundred years ago, describes the manner of attaching a crown by wooden, and also by metalic pivots or tenons.

Since the introduction of porcelain teeth, this method has been practiced to a very great extent, and oftentimes by the hands of incompetent and inexperienced operators. The common practice is to merely mark the tooth with a file at the margin of the gum, clipp off the crown with the excising forceps, extirpate the nerve with a drill and file to a level with the gum. And after filing the porcelain crown, and enlarging the canal of the root, a hickory pivot forced into each, driving the tooth close up to the gum, completes the operation, and the patient goes off highly pleased. But this pleasure is generally of short duration, for in a large number of cases so treated, inflammation of the periosteum, and suppuration of the remaining portions of the pulp ensues, and troublesome alveolar abscess is the result; often remaining as long as the tooth is in place. Numerous contrivances have been proposed to obviate this very serious difficulty; such as grooves and perforations in the pivot for the escape of the purulent secretions. But there are so

many serious objections to the use of wooden pivots in any of these forms, that they have been almost entirely laid aside by the bests operators in the profession.

There are several different modes of attachment by metalic pivots that have been practiced by eminent operators, which are superior in most cases to wood alone. The English dentists have practiced for a long time the mode of attaching the tooth to a gold wire, wraping this with silk, and after being saturated with a thick solution of mastich, it is forced into the canal of the previously prepared fang. Others have used a simple gold pivot fitted into the root; but these soon become loose by wearing, and the action of the fluids of the mouth on the walls of the canal, and to obviate this, some have filled the canal securely with a pin of hard wood, and then drilled into the centre of this for the introduction of a close-fitting gold pivot. This method affords a very firm hold, and a tooth fitted in this manner will last many years, under favorable circumstances.

In all the foregoing methods described, the walls of the canal in the root to which the tooth is attached, are necessarily exposed to the action of the fluids of the mouth, and these by decomposition, become corrosive agents, gradually enlarging the canal, and finally entirely unfitting it for the retention of an artificial tooth. To prevent this destruction of the fangs, a method has been adopted of securing a gold tube in the canal, into which the gold pivot is accurately fitted, thereby making a very perfect operation. The manner of effecting this, will now be described in detail, and also the manner of attaching artificial crowns to molar teeth.

If the tooth still retains its vitality, the pulp being exposed, and the patient will not submit to its extirpation with an instrument, we at once decide on destroying its vitality by the application of arsenious acid, and this can better be done before the removal of the remaining portions of the crown.

The arsenious acid should be combined with twice its weight of sulphate of morphia, and intimately mixed with

a sufficient quantity of creosote to form a thick paste, and having saturated a very small pellet of cotton with the composition, it is applied directly to the exposed pulp, and the remainder of the cavity filled with wax and cotton, as directed by Dr. Maynard, or with tin foil packed moderately close. This is permitted to remain from ten to twenty-four hours, when the nerve will generally be found to have lost its vitality, and can be removed without pain, sometimes coming away entire.

If the tooth has already lost the vitality of its lining membrane, or as soon as its destruction is affected by the arsenic, or if the patient will submit to its extirpation by mechanical means, we proceed at once to remove the remaining portions of the crown; and this should be done with the greatest care, so as to prevent injury to the alveolo-dental periosteum, thereby lessening the probabilities of success. The best method is to use an instrument constructed somewhat like a file-carrier, with a very narrow main-spring saw about two inches in length, properly secured with clamps and screws, to a small bow similar to the saw-frame used by jewellers, except that the saw should cut at right angles to what it does in that instrument. With this contrivance the entire crown, or any portion of it can be removed without danger of fracturing the fang or injuring the investing membranes. Where the nerve still retains its vitality, the first contact of the saw would be productive of intense pain: therefore we should saw half through the dentine on all sides of the tooth, then clip off the crown with the excising forceps.

Having sawed off to as near as possible the proper length, the next operation is to remove any remaining portions of the nerves and blood vessels, and file off the end of the stump to a smooth surface, to within about one half, or one fourth of a line from the margin of the gum. Round off the sharp edges of enamel on the posterior and approximal portions, and bevel the anterior edge a little below the margin of the gum, giving it a slight concave appearance, so as

to accommodate the neck of the plate tooth which is to rest against it. It is better at this stage of the operation, to stop the canal loosely with a pellet of cotton or floss silk saturated with spirit of camphor, and dismiss the patient for two or three days, when, if no inflammation be present, the canal may be cleaned out, and carefully filled, from the apex to within four or five lines of the orifice with gold foil. Any favorite method of fang-filling may be employed, but one of the best is to carefully introduce the first piece of gold in the form of a conical shaped "cylinder," rolled on a small five-sided broach till it is of a size and shape to fit the canal, then force it well to the apex with a straight fang-filling instrument; the remainder is then filled with pellets or ropes as usual. The remaining portion of the canal not filled, should now be enlarged to about one line in diameter, if the size of the fang will admit of it, down to the gold filling, making the bottom smooth and solid, and the sides parallel. The orifice, to the depth of nearly a line, is again enlarged with a bur to about two lines in diameter, and a small groove, or undercut is formed around the margin for the retention of the gold filling subsequently to be introduced around the tube.

For the tube, either the hollow gold wire described by Prof. Harris in his "Principles and Practice," or simple gold tubes, made of gold plate may be employed. If the latter be chosen, they may be formed by bending a piece of ordinary gold plate around a wire, so as to form a cylinder sufficiently large to fit the smaller portion of the canal prepared for it. Then solder with gold solder as fine as can be used. A piece of the tube half an inch in length should now be cemented with shellac into a hole bored through a piece of wood half an inch in thickness to serve for a handle, while the interior is carefully dressed out with a jeweller's broach which has a slight taper, making it smooth and regular within. A solid gold wire pivot is now carefully filed and fitted by grinding with fine emory and water, making a "ground joint," whereby the pivot is firmly held when in

place. Any portion of the wire that may now project beyond the smaller end of the tube, should be cut off even, while at the larger end it should project at least one fourth of an inch.

The tube must now be taken out of the cement, and a piece of plate soldered to the smaller end, forming a *bottom*. An easier flowing solder should be used for this, so as not to disturb the first. This tube, or *dress cap*, thus formed, after being "pickled," and filed off smooth, is ready to be inserted into the fang.

Some have proposed to cut a screw on the tube with a screw-plate, and with a tap to cut a corresponding thread in the fang, whereby the tube is firmly secured in its place, and filled around with gold. But the most convenient way is to cut a number of barbs with a sharp knife on the outside, looking toward the open end, so as to securely retain it in place when filled around with gold. Being made so as to go into the root rather loosely, several folds of gold foil are wrapped around it, and after carefully drying the parts with bibulous paper, the pivot being in its place in the tube, the whole is forced to the bottom of the cavity, and the loose portions of foil cleaned away from around it.

Having previously prepared some adhesive foil, and suitable instruments all ready, keep the tube and root free from moisture until the space around the former is perfectly filled with gold, and perfectly consolidated. The gold pivot is now removed, and the tube carefully sawed off nearly level with the end of the fang. Then by filing and consolidating the whole must be made smooth, and the surface and edges of the end of the fang well polished. We now have the fang perfectly preserved, with a good filling, and a gold tube firmly secured in it, with a gold pivot accurately fitting the latter.

The next operation then is to secure a suitable tooth to the pivot, and for this purpose a plain plate-tooth is selected that will fulfil the requirements of the case in size and shape; the color, of course, should be as near the same shade of the

adjoining teeth as possible—even a shade darker would form a less conspicuous contrast than any lighter. This tooth should be ground and fitted to the beveled edge previously formed on the anterior side of the root, so as to have the free margin of the gum cover the point of union. Then after soldering and finishing up a strong backing upon the tooth, it is fitted into its proper position, with the gold pivot in place, on which has been soldered a small shoulder or ring of plate, and the projecting portion of the wire cut off. The best method of securing the shoulder in its proper position, is to cut out a disk of gold plate larger than the diameter of the pivot, which is perforated with a hole just large enough to admit the pivot up to the point at which it is to be soldered—and this should be a little less than the depth of the tube—and being retained at this point, it is made to fit closely down on the fang, the whole then carefully withdrawn and placed up to the ring in plaster and asbestos. If the ring be loose on the pivot it must be kept in place by a bit of wax or plaster while withdrawing them from the tube, and as soon as the investment of plaster and asbestos is dry the wax is removed, borax applied, and the piece soldered with *fine* solder. The pivot is now tried again in the mouth and if the fit be satisfactory, the projecting portion is cut off and any prominence filed smooth so the backing and the tooth can be properly adjusted to it The tooth can now be attached to the pivot by a small portion of shellac, again tried in, and altered if necessary till the position is satisfactory. If the pivot does not fit too tightly, the whole can be withdrawn together, entirely invested in plaster and asbestos, except the portion on which the solder is to flow, and when dry, the cement is carefully removed, borax applied and the union strongly soldered.

The piece is now finished up, reducing the shoulder around the pivot to less than half a line in breadth, as a large plate covering the end of the fang would be of no advantage, but would only form a lodgement for foreign matter and the secretions of the mouth, whereby decomposition and

consequent destruction of the dentine of the fang would be the result. If the pivot is not retained sufficiently firm in the tube, it may be wrapped with a very few fibres of floss silk or cotton, and when forced into its place with a slight rotary motion, it will remain quite firm, and can be used by the patient with almost as much satisfaction as a natural tooth. If the adjustments have been properly made, the shoulder or flange will fit up closely and rest on the edge of the tube, the neck of the tooth resting on the beveled edge made for its accomodation, thereby preventing the tooth from turning on its axis, and the juncture is hidden by the free margin of the gum.

Artificial teeth attached by this method, if the operation be faithfully performed and the patient take proper care of it afterwards, may be retained and used with the greatest satisfaction, for many years. They should be removed at least three times a week, the parts thoroughly cleaned, and the pivot if necessary, wound with new fibres of cotton or floss silk before returning it to its place. Proper care and cleanliness will entirely prevent any recurrence of decay in the fang, and the appliance is far more permanent and less inconvenient than any other kind of dental substitute.

The principle as above described, can only be used in attaching artificial crowns to the six anterior upper teeth, and perhaps the lower cuspids; the fangs of the lower incisors being too much compressed to permit the introduction of a tube of sufficient size. The molars and bicuspids, however, may be accomodated by a modification of the process, using two or three smaller tubes instead of one, with corresponding pivots soldered to the gold base to which the teeth are attached. But the better way of treating these teeth, especially the molars, where an artificial crown is called for, is to adopt a plan suggested by Dr. Maynard of Washington City. This consists in making a crown of solid gold, or of porcelain, and attaching it to the previously prepared base by means of screws, and then filling around the juncture a ring with adhesive gold, or common gold foil, thereby

excluding the secretions of the mouth, and making a much easier and more perfect operation than by building on an entire crown with adhesive gold.

The root or base should present all the healthy indications before enumerated in the case of incisors, and each fang should be thoroughly and carefully filled, together with the pulp cavity, or as much of it as is left, and the whole base is then made smooth and polished. Then with a proper instrument a small shallow groove is cut around the margin of the base to retain the filling; it is then ready for the attachment of the crown.

A model of wax should be made, fitting the basement already prepared, properly articulated with the tooth above, and of the desired shape of the crown to be attached. From this model is made a mould or matrix of fine sand and plaster, and, after thoroughly drying, the gold may be poured in in a melted state from the crucible, the mould having been previously warmed. This may now be finished up and polished, and two or three holes drilled vertically through it so as to come on to the most solid portions of dentine in the base. These are deeply countersunk at the coronal aperture, to give place for the heads of the screws. A similar crown may be carved of porcelain, so as to represent the natural tooth, having the apertures for the screws drilled through before baking. Or merely a buccal surface might be made by the manufacturers, furnished with platinum pins by which it could be soldered to the gold crown, where the operation would be likely to be exposed to view in the mouth.

The crown, whether of gold or porcelain, is now placed on the base, which it should fit accurately, and the places for the screws marked and the holes drilled. Gold screws are made of the proper length, and with a tap, threads are cut in the base for the accomodation of each screw. A small groove or undercut is made with a graver around the periphery of the base of the crown, corresponding to the one already made in the base itself, for the retention of the gold filling.

All the parts are now thoroughly dried, and having all the requisite appliances for completing the operation at hand, the crown is securely screwed to the base, and the groove at the juncture carefully filled with gold foil; also filling over the heads of the screws as in common crown cavities, thereby excluding entirely, all foreign matter or buccal secretions. The surfaces of the fillings are now finished, and the whole operation completed.

These operations necessarily require a considerable amount of patience and skill in their performance; but there are many cases in which they are called for either by the necessity or preference of the patient, and whatever can be done by the dentist toward the preservation or restoration of the natural teeth, without encumbering the mouth with plates, clasps, &c., should be considered the highest productions of his professional skill. And where a very useful organ can be restored to do good service by such means, they should not be considered "fancy operations" but the utmost resources of scientific knowledge, and mechanical skill should be brought into requisition, to produce results *as near perfection as possible.*

ARTICLE II.

Anatomy and Physiology of the Teeth.

By James B. Hodgkin, D.D.S.

The teeth—their beauty as ornaments—their usefulness as organs—their characteristics; would make up a volume, much less an article of a few pages. Their Anatomy and Physiology is the theme of the present paper.

It is not necessary to give the divisions of incisors, &c., and passing over these and other preliminaries, we will briefly notice their physiological development, as seen in intra-uterine life, and trace this development into the tissues which compose them when erupted.

In the study of the anatomy (comparative) of the teeth, it would be interesting to note among the various classes of

mammalia the differences in their structure and the various combinations of the elements (not ultimate elements, but those of structure, enamel, dentine &c.) which go to form that structure. It is impossible within the limits laid down for this paper to go into this investigation to any great extent, and I will content myself by merely stating that of the elements of tooth structure, dentine is the most common and is universally present in the body of the tooth. Enamel is much less constantly found,—is in fact often wanting entirely, and certainly where present is often dispensed with without injury. Cementum is generally found with dentine, and seems to stand as a sort of intermediate link between the hard, nearly inorganic dentine, and the subjacent soft tissues—a sort of compromise between bone and tooth.

In the 6th or 7th week of intra-uterine life, a ridge appears in the mouth of the fœtus where the coming maxilla is to be, the groove anterior to this ridge separating it from the lip, and posteriorly from the tongue &c.

Shortly this ridge is itself grooved, and in this (primitive dental) groove appear small papillæ, the germs of the deciduous teeth. These are soon partitioned off, one from the other, by septa which enclose them on the sides; the sides of the groove already enclosing them are the labial and lingual surfaces or rather sides. These are next covered in by opercula shooting over and meeting above them.

A curious provision is here made for the development of the permanent tooth. The operculum which advances toward the centre from the anterior portion of the maxilla closes in and fills up the space between the ridge and the papillæ; not so, however with the other, the posterior, for it, as it were, divides and leaves between its folds a cavity—the "cavity of reserve," in which is developed the permanent tooth, now in the rudimentary stage. These cavities with their contents, which are at first found behind and partly above the primitive or deciduous papillæ, by degrees descend until from having been as just described, *above* they pass *behind* and *below* the first, and stand ready to take their

places in time. They are to be the permanent teeth, though seldom in this day retaining their claim to that designation throughout life.

Physiologically, the "six year," as they are termed, or the first permanent molars belong to the second dentition; but inasmuch as they arise from and are developed in the primitive dental groove they are anatomically assigned to the class of deciduous teeth; as they are not developed from "cavities of reserve," as are all other permanent teeth. In passing, it may be remarked that the second molars are developed from cavities of reserve cut off from the first permanent molars, and that the third (dens sapientiæ) are in turn developed from a cavity of reserve cut off from the second molar.

Let us for a few moments peer with curious eyes into the mysterious development going on within the dental capsule, which we have thus seen enclosed about the rudimentary tooth, and lay bare and understand, as well as we may, the hidden processes, and endeavor to comprehend its evolutions.

On the surface of the papilla is developed germinal matter, subsequently to be converted into dentine, and on the internal surface of the operculum germinal matter, to be developed into enamel is being also formed. The "germinal matter" of the dentine growing out from the papilla, meets that growing from the enamel organ, the point of contact being that of the first production of "formed material"—that is, the oldest formed material is on this line of meeting. It is at this point that calcification begins, and it proceeds *out* for the enamel, *in* for the dentine.

While the enamel is fully calcified, and rendered a mass practically inorganic and lifeless by that process, the same is not true of the dentine. It is not fully calcified, that is all the fibrillæ of "germinal matter" which form its structure do not harden, but many are left as soft intertubular masses, which seem organically continuous with the pulp. It is these that are sensitive in excavating dentine. Whether

they are simply masses of "germinal matter" with endowments of pain conduction, or whether they are connected with the ultimate fibrillæ of nerves is a question over which much obscurity hangs. It is highly probable, however, that the nerve tissue of the pulp is organically continuous with these fibrillæ; at least there is no evidence that they do not thus terminate, and the most that can be said is that we have been unable to trace this connection. Much light needs to be shed on this subject before it is fully understood.

The fact that dentinal fibrillæ heretofore uncalcified may do so at any time is a curious and important one. In anatomical structure they are larger on the surface of the pulp than elsewhere, and as they radiate outward toward the periphery of the dentine they branch, subdivide, and anastomose until they are lost in infinitely small and imperceptible termini. I have said that they are subject to calcification, and this may go on (it probably never does, but there is no reason why it might not occur) until not only are the intertubular substances calcified, but the pulp itself, with which, as has been before stated, they seem organically continuous.

The "zone of consolidation" in caries is considered as a proof of the inherent power of the pulp to calcify, manifested under exciting causes. This may perhaps be only partly true, for we do not *know* that the pulp substance itself does calcify—we do not know but that a compound process goes on in this case, the sequel of which is the formation of calcified substance from germinal matter. It is true that practically it is not a matter of much importance as the pathological treatment would of necessity be unchanged.

Enamel in its development assumes the form of primitive hexagonal rods. It, different from dentine, calcifies as before stated throughout its substance. It has no intertubular substances, no power of repair—it is dead.

The cementum investing the root of the tooth, much resembles bone in its anatomical structure, with lacunæ, canaliculi, &c., but is more dense, and has fewer of those char-

acteristics which so markedly distinguish bone. In cases where it becomes very-dense, there seems to be an incompatability established between it and the surrounding soft tissues, which sometimes eventuates in loss of the organ. It is also the seat of the disease known as exostosis of roots, and sometimes when exposed is quite sensitive. It is invested with periosteum, and is nourished from it by germinal matter developed on the internal surface of that membrane, which is essentially a bone-feeder and producer.

The Pulp, consisting of arteries, veins, nerves, &c., held together by connective tissues, is a highly vascular structure, capable of high inflammation, and of exquisite sensibility. It is the organ of life to the tooth, its vital developing principle. To what extent the parts of the tooth adjacent to it (the pulp) are nourished by it, it is difficult to say. We know that its loss, death and removal, does not of necessity involve the loss of the tooth, and this has led some to the conclusion that it is only of use as an organ of development, its work being finished with that development complete.

But it is certain that nature never works thus clumsily, leaving in the organism a thing whose uses have ceased. That it serves to convey nutrient material to the intertubular, non-calcified portions of the dentine is quite certain, and we know that all sensation in the dentine ceases on its (the pulp's) destruction. We find also calcification going on slowly through the years of childhood, and of adult life to old age, the foramina of the nerve canals (pulp canals), which in early life are larger, growing smaller, and the pulp cavity itself decreasing in size; and in old subjects septa are found forming in the pulp canals in some cases, dividing them into secondary canals, or nearly obliterating their cavities. The "zone of consolidation" in caries would seem to imply either that a reserved power resides in the pulp for special contingencies, or that a special function is developed for an emergency.

The diseases of the Pulp belong to the domain of Pathology.

TICLE III.

uralgia.

EDWARDS, D. D. S.

ed from two Greek words, *neuron*,
s a term applied to an affection,
ncinating pains in one or more
ody, the nature of which, being
e, highly organized and sensitive
ny, presents an entertaining study
; and is invested with no less
the student, who selects Dental
medicine.

lf in this paper, more particularly
that comes more directly under
ental practitioner, and deem no
remarks I shall make upon the

been substituted for that of Tic-
d to designate a pain of a purely
d in the nerve substance; and dif-
ensations of a painful character,
r congestion, inflammation, &c.
confined to the nerves of general
or more of these nerves are the
y themselves are the sufferers;
the nerves are the vehicles by
re conveyed, or transmitted to the

seated in any organ of the body
rves, or their branches, are distrib-
tion, however, is most frequently
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robably from their more exquisite
their greater liability to injury by
tants. In whatever organ or part
ins make their apperarance, the

expression of suffering or pain is varying in both character and intensity; and the medical vocabulary has been utterly exhausted, and still fails to give a correct and concise expression to the sufferring.

The attacks of neuralgia may recur at intervals of only a few moments, or they may take place daily, every other day, or even longer intervals may occur, regular or irregular, and the pain is sometimes continuous, with increased and exalted fits—some writers describe it as burning, darting, twinging in its momentary duration. It is also attended occasionally with spasmodic contraction, or twitching of the muscles of the affected part.

The pathological condition that seems most favorable to an attack of neuralgia, are numerous; some of the most frequent may be summed up as follows:—A weak and delicate constitution; scrofulous rheumatic, gouty and nervous diathesis. It may also attend functional, or organic diseases of the viscera; of the genital organs, especially the uterus; and it is not unfrequently that these organs make their distresses known through this medium. "It has been more than once in my practice," says Dr. Wood, "the immediate precursor or rather the first obvious sign of Bright's disease of the Kidneys, and sirrhosis or other fatal organic affections." And finally, it may be caused by "Malaria, or Marsh-poison"—a name given to that peculiar condition of the atmosphere, that usually gives rise to intermittent fever, and other paroxysmal diseases, and when from this cause, it generally, probably always, assumes the regular intermittent form, so characteristic of that family of paroxysmal diseases eminating from the same source.

Of the exciting causes of neuralgic pains, I might enumerate a great many that act as local irritants, such as diseased, or dead teeth, tumors, wounds, and quite frequently by spiculae of bone and bony excresences pressing upon a nerve in its course through foramina, bony canals, &c. When forming our diagnosis, we must discriminate between neuralgic pains, and those of an inflammatory character,

[illegible] upon vascular congestion of the [illegible] diseases seated in the sheath of [illegible] known as neurites.

[illegible] always, easy to distinguish these [illegible] on inflammation by the absence [illegible] sometimes, when the malady con- [illegible] parts may assume an inflamma- [illegible] effusion of serum, may become [illegible] it has gone so far, without the [illegible] to the practitioner, the case is [illegible] diagnose. Here the careful prac- [illegible] ct, in very many cases, the true [illegible] e presence of cutaneous sensibil- [illegible] by firm pressure, which will indi- [illegible] in inflammation, there is no ten- [illegible] being constant, and greatly aug- [illegible]

[illegible] cial Neuralgia, is that form of the [illegible] rectly under the observation of the [illegible] is probably the most frequent, [illegible] fferent forms of the malady, and [illegible] re; often the most excruciating [illegible] apparently the slightest causes. [illegible] causes are so insignificant as to [illegible] sufferer—any sudden noise, or [illegible] h, and sudden changes of tem- [illegible] ause the pain to be manifested. [illegible] se the morbid condition is seated [illegible] pair, or trifacial nerve, or some [illegible] hen we remember its organ, its [illegible] unyielding tissues, with which [illegible] es the hidden paths of the inte- [illegible] n readily understand how any [illegible] tissues, exerting undue pressure [illegible] a severe form of neuralgia, to [illegible] hich, will baffle and defy the un- [illegible] sagacious practitioner. The dis-

ease may extend to all the branches of the fifth pair on one side of the head and face; but more commonly it is confined to one of its principal divisions, of which, the infra-orbital is especially liable to be affected. In many instances it is thesituated in temporal and dental, and, not unfrequently, the terminal filaments merely become the seat of intense pain; consequently the malady is occasionally found limited to a patch on the cheek, brow, or temple, from which it rarely ever radiates or shifts.

In facial neuralgia, the causes are various. Many times it appears to be purely of a nervous character,—broken health, debilitating diseases, mental depression, fatigue and exposure to wet and cold, and malarious influences, being among the most common causes. And I have no doubt but that it is frequently occasioned by morbid conditions of the gums, alveolus and teeth, or their lining or investing membranes; by irregular crowded and supernumary teeth; and probably by a variety of other causes.

The pains may come on suddenly, may disappear and return without apparent causes, and may be of all degrees of severity, sometimes moderate, at others almost unendurable. When the attack is sudden, it is usually violent—of a darting, tearing character, sometimes radiating along the trunk or its branches, by which its course may be distinctly traced.

When a case comes under our observation, the symptoms of which are pain in the face or adjacent parts, we should direct our attention, first to the condition of the mouth, particularly the teeth, and if we find one in a carious condition we should examine it carefully—if the pulp be exposed, we may expect to find the pain more or less centralized in the carious one, and we may be quite sure of having found the offending organ. But on the other hand, if we find no diseased condition of the mouth, cheek, &c., such as caries of bone or dentine, or inflammation of the soft parts, we should direct our attention to the general health and condition of the patient, as well as to the character of the pain. If it

[illegible] on, we should suspect the cause [illegible] rtain that the patient has been [illegible] or exposed within the past few [illegible] pregnated with malaria, the [illegible] justify our diagnosis. If the [illegible] by intermisssions, however, [illegible] patient, we learn he has not [illegible] cality, we continue our search [illegible] suffering; and if we are so [illegible] ay apply our remedies with a [illegible] l to bring a speedy relief.

[illegible] a is established rather upon [illegible] upon any scientific precision [illegible] as both the ultimate and proximate [illegible] nena are obscure.

[illegible] ve been detected, and are well [illegible] ossible to detect one of these [illegible] specific, and may be applied [illegible] But, when we are not so fortu[illegible] r remedies are applied in an [illegible] t random, and our practice de[illegible] riments. At length we strike [illegible] or the case yields to the ben[illegible] case the last remedy tried is [illegible] duing the disease; hence has [illegible] dies of very opposite nature, [illegible] ystem.

[illegible] of neuralgia, is, as I have said [illegible] when arising from this cause, [illegible] ways, be detected, and then the [illegible] of medicines vaguely termed [illegible] are a great many of secondary [illegible] e principal are quinine and [illegible] n various doses and combina[illegible] practitioner.

[illegible] medies is not strictly limited [illegible] n. Arsenic has been found

useful in many other cases, and especially in hemicrania, or where the pain is confined to one side of the head; why this is so is not known.

Quinine also acts beneficially upon many cases where debility is a marked symptom—probably by virtue of its tonic powers. In such cases, it should be combined with some preparation of iron—a combination which will afford prompt relief in very many instances.

When the neuralgia is of an inflammatory origin, such remedies would be productive of harm. Frequently when quinine, iron, arsenic, &c., have been prescribed without effect, if a dose of calomel be given at night, and the ineffectual remedy resumed the next morning, prompt relief will be obtained.

When neuralgia is inflammatory, it is best combatted by the antiphlogistic remedies and anodynes. The disease, when depending upon pressure occasioned by morbid growths, such as I have before mentioned, must be relieved by removal of the morbid growth, or if that be impossible, section of the nerve is the only means of relief. All other remedies will prove unavailing for more than temporary relief, and even section many times fails to give permanent relief, and excruciationg agony will make life a burden, and death will be hailed as a happy relief by the unfortunate sufferer.

A vast variety of liniments and external applications, are recommended in the treatment of this malady, and are often efficacious for temporary, and even permanent relief. But in none of them can it be supposed that any special virtue resides; they all act upon one and the same principle— that of counter-irritation or revulsion, which apparently consists in making a new impression upon the part—upon which the morbid action subsides. Some of these local applications, however, contain anodyne remedies, which are to some extent absorbed by the surface to which they are applied, and act by destroying or impairing temporarily the sensibility of the part. In cases of pure neuralgia which occur in the

upon those medicines that
and strength of the patient;
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itated sub-carbonate of iron,
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or fangs they should be ex-
any other be found in a state
filling, this operation should

ought to the notice of the med-
which is highly recommended
, by gentlemen whose scientific
claim our attention, if not jus-
iven to this remedy is Narcein.
ples of opium, and resembles

morphia, not only in the fact that they are derived from the same base, but also in its action upon the nervous system as a sedative and hypnotic. It is claimed for this preparation that it acts beneficially in cases where morphia is either not tolerated from the begining, or where it has lost its effect by long use; it also acts more promptly than morphia. "It produces sleep, which is soft, tranquil, uninterrupted, and followed by a quiet waking," without the unpleasant effects that sometimes ensue from the use of morphia. These are the general principles of the treatment of neuralgia, and by attention to them, most cases may be, more or less, speedily relieved. But occasionally, every expedient will fail, and the disease will continue to torment our patient in spite of our efforts.

When we witness the many wonderful discoveries and improvements in the various departments of art and science, with which the present century teems; when we see the might genius and intellect, which is being directed to the improvement of the condition and the relief of suffering humanity, we are justified in the belief that this hitherto terrible and but partially understood disease, will yet find its panacea in the investigation of science, and will readily yield to the treatment of the skillful.

ARTICLE IV.

Investigation of a Malformed Tooth of the Lower Jaw.

(Translated from the German of Prof. Wedl. By Mr. O. Salomon.)

Dr. Steinberger at a meeting of the Austrian Dentists described an interesting case of a malformed tooth situated in the lower jaw of a young lady aged 18 years, the diagnosis of which was very difficult and highly important.

The history of this case is as follows: The patient presented herself to Dr. S. six months before having an immense swelling on the right side of the lower jaw, extending from near the coronoid process to the second bicuspid, and having a diameter of two inches across the jaw. The enlargment of bone was much greater externally than inter-

...on the inside of the cheek was
... membrane. The tumor inter-
...osing of the jaw rendering mas-

...themselves during the eight days
...elf, were similar to those from a
...rded in its eruption from want
...ding portion of the jaw and the
... this case no molar teeth were
...ving been removed some years
...r never having made its appear-

...d nothing in the lower jaw which
...the free eruption of the wisdom
... he found that the superior sec-
...e, on closing the mouth, pressed
... in the lower jaw. To prevent
...a small piece of hard rubber was
...urfaces of the superior and inferior
...h were present, and by this means
...from coming together. Previous
...piece of rubber, intense pain fol-
...uth from the opposing molar tooth
...fter the application of the rubber,
...as experienced, and the inflam-
...ration the pus was let out by
.... The jaw, however, continued
... later a small opening made its
...the point formerly pressed upon by
...posite jaw. A probe introduced
...gum revealed the presence of a
...owever, so hard as what might be
...of enamel. The gum was then
...l yellowish-white formation with
...discovered firmly implanted in the

Although this was undoubtedly a tooth formation, yet, there was nothing present to account for the degree of inflammation excited, except it might be its inverted position and its irregular form.

Dr. Steinberger at this stage diagnosed the case as follows: That it was a malformed inverted second molar tooth, the papilla of which in its papillary stage had been disturbed from some unknown cause, and overlapped the papilla of the wisdom tooth, and this latter tooth developing pressed upon the malformed tooth giving rise to a high degree of inflammation.

Owing to the fact that but a small portion of the malformed tooth was visible after the dissection of the gum, it was necessary to remove a considerable portion of the bone of the jaw which covered it before it could be extracted.

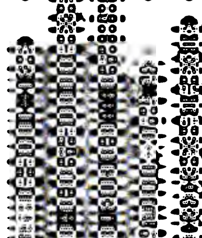
Before the operation, however, Dr. Weinlechner was consulted who differed from Dr. Steinberger in his diagnosis of the case, asserting that it was a sarcomatous cyst of the bone. Dr. Steinberger not admitting this view of the case, perforated the tumor with a small drill to the depth of half an inch, but did not find any cyst cavity, nor did any blood escape from the opening made by the drill, or pain to the patient. Still Dr. Weinlechner was not convinced, and Dr. S. detached a small portion from the bony mass and presented it to Dr. Wedl for examination under the microscope.

Dr. Wedl having pronounced the substance to be dentine, it was determined to extract it. Dr. Weinlechner first dissected more of the gum from about the tumor, and by means of an elevator attempted to dislodge the malformed tooth. Failing with this instrument recourse was had to the forceps, but no hold sufficiently strong could be obtained upon it. A screw, known as Serre's screw, was then inserted in the hole before made with the drill, and by means of this Dr. W. succeeded in moving the tooth, but could not dislodge it, and then resorted to the chisel, by means of which he enlarged the opening in the bone sufficient to allow the tooth to pass.

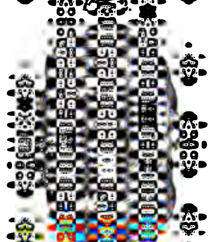
... chisel between the bony wall of ... f the tumor, a few blows of the ... formed tooth.

... e malformed tooth, in the bottom ... he partly developed crown of the ...

... following description of this mal- ... d form it resembled a chestnut, and ... measured 29 millimeters, somewhat ... nch, and the latitudinal diameter ... s weight, in a humid condition, ... ttle more than half an ounce. In ... ite, very dense in consistence, its ... vex and covered with many small ...



... view of the upper surface of mal- ... ooth, natural size.) On this surface a ... tened spot appeared, caused by the ... of the superior molar. The two ... rfaces were more convex and tra- ... canals. On the external margin of ... was a cavity quadilateral in shape, ... depth equal to between three and ... onding in size and form with the ... olar tooth, with two smooth walls, ... ward, and two irregular ones which ...



... g. 2. view of the base of the tooth, (*a*) ... al surface, (*b*) external surface, nat- ... ze.) About the periphery of the base, ... he exception of that portion occu- ... y the cavity just referred to, hung ... gh cellular fringe having a strong ... on.

...he malformed
...ity formed by
...to the micro-
...posed of den-
...on the upper

...S.

...l of *Superior*

...dinburg.

...Medical College.

...54, married,
...eman Rogers.
...e face, and of
...ghteen months
...somewhat ob-
...t sensation of
...ame complete,
...he nose. Gen-
...d, and various
...Within the last
...cially towards
...deep, gnawing

of the face. On examination, the left
mpletely filled by a soft, pulpy mass,
l. The anterior wall of the antrum
the left side have both been absorbed,
immediately beneath the skin of the
membrane of the roof of the mouth,
but fortunately not to the former.
ppear to involve any of the other bones
n. I informed the patient truly as to
estructive nature of the disease; the
ediate extirpation, the excellent pros-
from the operation, and, with no less
es of adverse ulterior contingencies.
d to return, as soon as he had arranged
at home, and submit to the operation;
called on me on the 11th of April. In
or was found to have made very con-
The swelling had extended outwards on
s the malar bone) and the mouth was
The patient was fully conscious of the
ctions, and he complained of more con-
Otherwise his health was good. On
Drs. Octerlony and Coleman Rogers,
r, I performed the operation as follows,
en fully administered by Dr. Octer-
sion extended from the inner angle of
mouth at the middle of the upper lip;
of this a second was carried outwards
gin of the orbit to the maxillary pro-
e. The flap thus formed was reflected,
arteries tied as soon as divided, and
check the copious hæmorrhage from
the tumor. The eye and subjacent
dissected from the orbital plate, the
the roof of the mouth divided through
the bone isolated by sawing and nip-
e bone pliers; the alveolar, palate, nasa

and malar processes, and the pulpy mass, without any difficulty (except what result from its want of cohesion) wrenched out. No vessels were tied in the cavity. The most careful examination convinced all present, viz: besides the gentlemen before mentioned, Drs. Lewis Rogers, Brandeis, Logan. Satterwhite and Turner Anderson, that the whole of the diseased tissue was removed. The cavity was stuffed with lint soaked in a solution of carbolic acid, and the edges of the wound drawn accurately together with silver sutures. The progress of the case after the operation was as satisfactory as could possibly be desired. The wound healed by the first intention. The cavity soon commenced granulating, with every appearance of healthy action. The functions of deglutition and articulation, at first somewhat impaired, were in the course of the first week as fully restored as could be expected under the circumstances. The patient slept and ate well without medicine of any kind; indeed, it may be worth while to mention here that, except a mercurial purge, the day before the operation, one dose of McMunn's elixir immediately after, and one dose of castor oil on the third day after the operation, no medication whatever was resorted to, and this notwithstanding that erysipelas appeared on the face on the fourth day. This complication was just permitted to run its course, as it would have done, even in the face of the most strenuous efforts to arrest it; and at the end of a week it had disappeared, after having passed all over the head and neck, without, however, causing serious inconvenience. On the eleventh day after the operation the patient returned to his home, a distance of more than 100 miles, and on the 31st of April I received a note from him, dated on the 30th, in which he says, "I have improved every day from the time I left you, and am now in fine spirits."

The structure of the tumor, when submitted to microscopic examination, was found to vindicate the opinion which had been confidently expressed, as to its malignant nature.—*Richmond & Louisville Med. Journal.*

ARTICLE VI.

...ing Dental Hemorrhage.

...idson, M. D., Colchester, Ill.

...f July 5th, 1868, at two o'clock A. M.,
...olumbus H., aged 18, of sanguine tem-
...ical development, and by occupation a
...ffered from odontalgia for a week, and
...ad had the middle and posterior molars
...he *os maxillare inferius* extracted by a
...M., the other at 3 P. M. There was
...hage from the first, which became aug-
...ond tooth was drawn. The young man
...P.M.; the bleeding continued without
...ic remedies were used, *viz.:* salt, alum,
...hout effect; and professional aid was
...e.

... in a state of anxiety and alarm. The
... a pallet on the floor. The pillow was
.... A large cloth with which he wiped
...y dyed with the *liquor sanguinis*. The
...for several feet around the bed with
...a. In a vessel was contained more than
...rent. From loss of blood and rest, the
...inclined to sleep, which, however, was
...tches, on account of the accumulation
...tened strangulation.

...f the patient was striking. There was
...ltus; the face pale and haggard; pulse
...ing. Every 15 or 20 minutes he had
...h nausea, at which times the bleeding
...ase when the system rallied.

...ess of carded cotton, soaked in a satu-
...cid tanicum, laid on the gums, to b...
...rcibly closing the jaws. This checke...
... time. Firm pressure on the caroti...
...e hemorrhage. Not having a more pow...

erful styptic at hand, I broke up the coagula in the bleeding sockets, and with a small pointed syringe injected the *tinct. ferri chlo.*, as near the seat of hemorrhage as possible. I then saturated a fresh compress of cotton with the tincture and applied as the first, enjoining the patient to make firm, pressure with the lower jaw. The bleeding was at once arrested, but returned in about an hour. A fresh compress, prepared as before, was applied, and the bleeding ceased for three hours, when it partially returned. The cotton and superficial coagula were removed; another application of the remedy as before, and the hemorrhage was permanently arrested. Rest and quiet were enjoined, and a nutritious diet ordered, with the following:—

℞. Tinct. Ferri Chlo., S. M. x. Three times a day.

This to be followed in four or five days with—

℞. Elixir Calisa. Ferrat., S. ʒ iv. Three times a day.

Patient's recovery somewhat tedious, but satisfactory and complete.

I ascertained that both parents of the young man were of the hemorrhagic diathesis, and that every member of the family was prone to bleed much and persistently from slight abrasions. None of them, except the patient, had ever had teeth extracted at adult age.—*Chicago Med. Examiner.*

ARTICLE VII.

Treatment of Alveolar Abscess.

By C. S. Chittenden.

In my remarks on the treatment of this disease, I propose to confine myself to those cases which arise from the destruction of the nerve, either from exposure from decay, or from the use of devitalizing preparations. The first thing to be done is to discharge the abscess. If no opening has been formed through the alveolus and gums, I clean out the pulp chamber and open the nerve canal, and then pass a small broach up or down, through the apical foramen, (this can be done much more easily after suppuration has taken place than while a

[illegible] in the canal) and allow the pus to [illegible] When all the pus has escaped, [illegible] I inject tepid water into the canal [illegible] hly as possible from all putrifying [illegible] ty of decay with cotton dipped in [illegible] remain in that condition for a day [illegible] again with tepid water, and inject [illegible] of silver into it. I use the nitrate [illegible] of *stimulating* the inner surfaces [illegible] action ; I then close the cavity [illegible] wo with cotton and sandarach, and [illegible] t nature has cured the disease when [illegible] If not, I use a dressing of creosote [illegible] re of Iodine for a few days longer. [illegible] through the gums I open the nerve [illegible] cut down through the gums and [illegible] he root of the tooth, and discharge [illegible] through the gums. I then endeavor [illegible] trate of silver through the tooth [illegible] rnal opening which I have made. [illegible] nal with cotton to stop any fetid [illegible] it, I pass a tent of cotton into the [illegible] prevent its closing, and stopping [illegible] ng out through it. One, two or [illegible] required, according to the health and [illegible] ut I always feel *certain of success* [illegible] apt the treatment perfectly, in the [illegible]

[illegible] ppears to be in a healthy condition, [illegible] it is firm in its socket, and no pain [illegible] smartly, I, at once proceed to fill [illegible] cavity of decay with gold. I do [illegible] to wait for the external opening to [illegible] le fear that any trouble will arise, [illegible] been so perfectly closed that nothing [illegible] the opening at the end of the root. [illegible] *Dental Science.*

ARTICLE VIII.

Dental Hygiene.

By Samuel Welchens, D.D.S.

[Read before the Pennsylvania State Dental Society, at Harrisburg, June 8th, 1869.]

The importance of a good hygienic system in the several branches of medicine cannot be over-estimated. To preserve health should claim the attention of science, fully as much as the means of restoring it when impaired or lost. The physiological relations of the various parts of the human structure are so nicely balanced, while the elements of life and death are in such close proximity, striving continually for the mastery, that the highest attainment in professional skill, and the broadest and most comprehensive experience should be brought into requisition, in order to keep the phenomena of *vital activity* in channels of health and happiness. *Dental hygiene*, though to some extent a specialty, partakes in a very large degree of the elements of dependency. It involves some of the most important functions, and must, from the very nature of the case, be conditioned and influenced by the general laws of the economy.

The capillary network, which derives its nourishment from the systemic circulation, constitutes the source of vitality to the teeth, and to keep it in an active, healthy condition, so as to perform its functions properly, and build up and establish those hard unyielding structures, and develope, in the process of growth, a strong and enduring denture, is the subject of our present inquiry.

The human teeth are of that class of organs which are not in any direct relation with the blood-vessels, and yet which derive their whole nutriment, and the material of their functional operations, from the blood. In all other respects they are almost a separate and distinct creation. They begin to form, and become developed, when all the other organs are already faithful to the want of the economy, and are destroyed by disease and decay with but little serious inconvenience to the system.

[illegible] ...d as the hardest organic substance
[illegible] ...eans the most durable. By their
[illegible] ...ere evidently intended by nature
[illegible] ...r and tear of mastication. But,
[illegible] ...estined to sustain shocks and trials
[illegible] ...ts and external abuses, so that the
[illegible] ...performed between two most pow-
[illegible] ...n.

[illegible] ...so far, at least, as external usage
[illegible] ...l violence; and, where this is not
[illegible] ...gard to the teeth, their low vital
[illegible] ...n themselves, from the surface, by
[illegible] ...r raised to a state of inflammatory
[illegible] ...corrosive applications, fully as de-
[illegible] ...health.

[illegible] ...a fruitful cause of decay, but it
[illegible] ...those who are scrupulously cleanly,
[illegible] ...s and filthy; so that the popular
[illegible] ...those organs is caused solely and
[illegible] ...nts is, for the most part, erroneous.

[illegible] ...paper, is to combat this theory, and
[illegible] ...of decay in the teeth is attributable
[illegible] ...and an insufficiency of capillary nu-
[illegible] ...not more, than to careless habits
[illegible] ...f external abuse; not, however, for
[illegible] ...ng sanitary measures, but to direct,
[illegible] ...the internal—so that our hygienic
[illegible] ...d benefit the race from both stand-
[illegible] ...ries.

[illegible] ...three several conditions of the econ-
[illegible] ...sible to so derange the functional
[illegible] ...e a corresponding derangement of
[illegible] ...n tissues; and the complex organic
[illegible] ...the teeth being such as to deprive
[illegible] ...rative action, *stagnation*, leading to
[illegible] ...*ys*, is the result.

The first of these conditions is that pathological state produced by mesenteric derangements and eruptive fevers incident to child-bed, whereby there is an undue consumption of capillary nutrition, and inability on the part of the tissues to appropriate proper aliment, which produces not only weak and delicate teeth, about the time of their formation, but the unsightly deformity of what is termed *dental atrophy*.

The second condition is an enfeebling or weakening process in the systemic circulation, by which the function of assimilation is retarded or defeated altogether, especially in the hard tissues of which the teeth are composed, and thus rendering them soft and liable to disease and decay.

The third condition or element of decay in dental tissue arises from an undue acceleration of the local circulation, producing active congestion in the soft tissues, a gorging or choking of the vesicles by a too rapid interstitial deposit of the mineral substances, designed by the economy to harden the teeth.

The foundation of a building or the fountain-head of a stream, must possess the ability to sustain that which depends upon it. The root of a plant must have absorbing surface to supply the wants of the stem and leaves. These are *axioms*, which will readily illustrate the absolute necessity of sufficient vital energy in the circulating system of the animal to supply a proper amount of nutriment to stimulate the entire capillary maze.

In all organic structures there are central or vital organs which supply functional power to those which are thrown to the surface, and the arrangement is to always have those organs deeply seated for their own protection, and that each succeeding strata of the fabric, as the growth is outward and upward, becomes more complex, and consequently less liable to injury, but at the same time less capable of recuperating their power when injured.

This general law of the economy is well-settled and most beautifully illustrated in the arrangement and formation of the human teeth.

[illegible] *ta petrosa*," the "*dentine*" and [illegible] three several divisions of the [illegible] ement gives the *cementum* the [illegible] ar tissue, because of its better [illegible] thrown in from the blood to be [illegible] of the more highly organized [illegible] d then, again, the *enamel* being [illegible] le to injury by reason of its [illegible] boldly to the surface, and fin- [illegible] of the animal economy.

[illegible] bout one-third per centum of [illegible] g its "*lacunæ*," and "*canaliculi*" [illegible] some extent, elaborating, the [illegible] the *periosteum* to nourish the [illegible] *ndosmosis*, or *imbibition*. This [illegible] holds the destiny of the entire [illegible] rganism to keep the *dentine* in [illegible] g a proper vital balance, is the [illegible]

[illegible] the most delicately organized [illegible] e of the economy. Its capillary [illegible] posed of the finest particles of [illegible] en with the azotized compounds [illegible] up the tissue, and by virtue of [illegible] sensitive character, it is easily [illegible] althy, vigorous action, by a [illegible] from the systemic circulation, [illegible] ther from the want of such a [illegible] erstitial deposit of its particles. [illegible] place through disease, a feeble [illegible] ases.

[illegible] ver, measles, or any of those dis- [illegible] l, the integrity of the blood [illegible] circulation and nutrition are [illegible] And when they are contracted [illegible] tion of the dental tissue, there [illegible] l matter for a perfect develop-

ment of the teeth, and especially of the enamel, and the result is that hideous malformation termed "*dental atrophy.*" Or a lack of *vital energy* may be superinduced from the same cause, and though there may be material enough to form a beautiful pearly denture, the organization does not go on vigorous enough to make it strong and enduring, and a soft chalky *enamel*, with a corresponing enfeebled *dentine*, is the result.

Sometimes, too, those pathological conditions are entailed from parent to child. This consumption of vital energy, and of capillary nutrition, thus become congenital, and that which is lost by the parent can never be regained by the child. The teeth always become involved in those defections, and can never be rendered strong and enduring in texture.

These are pathological conditions of the system, many of which must be allowed to run their course, and do their work of destruction. All the dentist can do is to apply his artistic skill, either in treating the natural organ, or supplying an artificial denture—there being no system of dental hygiene fully equal to the task.

We will therefore turn to our next element of inquiry.

An insufficiency of capillary nutrition, from whatever cause, will have a more damaging effect upon the teeth than any other part of the capillary system. A derangement of this sort in the epithelial and epidermic, and also the articular catilage vessels, can be more rapidly overcome, by reason of the flexibility of their walls, and their adaptation to the laws of tolerance prevading the entire structure. But the denser and more highly organized fabric which composes the teeth, is not possessed of such rallying power, and consequently must suffer injury corresponding to the amount of damage to the other tissues, done by such irregularity; and, not being able to recover as rapidly as the softer tissues, the the injury multiplies—disintegration is followed by disorganization and decay.

The operation of nature in the vegetable kingdom is anal-

...e to illustrate the idea we wish
... root of a tree promptly answers
... and leaves, all goes well; but
... foliage begins to flag and droop,
...eeds beyond a certain point, the
... If there is a deficiency or an irreg-
... surface of the root, it may not
... but, "leaf by leaf it will droop
...*decay*, and in a majority of cases
...umstances.

...nce of this deficiency of "*capil-*
...discovered. It occurs in all grades
...and does not escape the robust and
...e who are constitutionally delicate.
...llary circulation have been noted
...lation was in perfect condition.
...owever, when the heart's action is
...rrupted. And this can occur, and
...r, through some of the abuses of
... modern mode of life. Dissipation,
...reme changes in temperature and
...fficient diet, tight lacing, careless
...oms, are among the primary and
...d all of these irregular habits of
... sudden variations, either in whole
... network—the circulation taking
...idity in one part, and increased
... both are supplied by the same
... results of a chronic pathological
...ver, but a sequence of their neglect

..., the fashionable hotels and board-
...amazing consumption of dainties,
...he normal condition of the system,
...ent for a healthy development of
... those debilitating results. Go into
... and the brilliant entertainments

and balls where so many of the young, particularly in our large cities, almost live in seasons of gaiety and fashion—where the action of the larger organs is destroyed, and the functional power of systemic circulation is retarded, and the vital energy of the system is driven back upon its centre by the half sufficient dress, the congealing efficacy of a piercing atmosphere, and unseasonable hours peculiar to such a life. Go into the haunts of vice and dissipation, and mark the manner in which this grand human structure is abused by those whose interest it is to preserve it, and you have a solution at once of the problem we are endeavoring to solve.

But come home, and see whether your little son or little daughter is not suffering the same loss of capillary nutrition and functional energy by close confinement, either in the house or at school, or by the use of too many candies, too much ice cream, or by being over-fed at table with too much sweetened bread and a corresponding round of rich pastry and dainty dessert, without a balancing supply of the more solid food. Here it is that "*dental hygiene*" should interpose its gracious offices, to regulate these dissolute habits. Insist upon proper treatment in the case of children, and thus re-establish that measure of vital energy which our race is rapidly losing, by not knowing exactly how to live.

We may, however, be pointed to a class of people whose habits in life preclude the idea of their participation in any of those scenes of exposure and dissipation, or whose children are rarely indulged as above intimated, but where there seems to be fully as much decay in the dental tissues. Look at our sturdy farmers and woodsmen, and suburban laborers and mechanics throughout the country. They and their children are, for the most part, strangers to those excesses, and seem to be the very embodiment of robust health and manly development, and yet they come into our offices with as much dental distress as those above enumerated.

With this class of people *sanitary measures* will go far, very far, towards a propitiation of dental decay, and in perhaps the majority of cases will prevent disease until there

...d enduring texture produced in
...l the care that can be taken, all
...y stage and period, they are con-
...ality of an *exposed* and *aching*
...nd breaking in of the crowns or
...ll this be said to be the result of
...ries *alone?* May there not, after
...acter purely and entirely *internal*
...y obtain?

...ieve that there is, and the theory
...ect will claim the principles we
...rd and last proposition, namely:
...ay through an undue acceleration
...tion, from which there is a gorg-
...es, thereby interrupting functional
...lts similar to an enfeebling insuf-
...tion.

...etable kingdom, for example, in
...on, leaves may be observed to
...otwithstanding the fact that the
...igorous. This is the result of an
... circulation of the sap. Those
... choked by a too rapid deposit of
...ticles designed by nature to build
...struction is the result of this ar-

...lating through the *systemic* cap-
... its oxygen to the tissues it per-
...them carbonic acid. On the other
...gh the *pulmonary* capillaries, it
...o the atmosphere, and imbibes a
...Now, if either of these changes be
...e, a retardation, and even a com-
...lood will take place, the flow
...ng now resisted, instead of accel-
...ch the blood bears to the tissues."
...dition of the blood, in regard to

the relative proportions of its oxygen and carbonic acid, is the only one to which the pulmonary circulation is subservient; but in the systemic circulation, the changes are of a much more complex nature—every distinct organ attracting to itself the peculiar substances which it requires as the materials of its own nutrition." An acceleration when undue and abnormal, of this character, is known as "*active congestion*," or "*determination of blood*." In the softer tissues these pathological conditions cañ be arrested before inflammation or stagnation sets in; but in the denser or bony tissues, and especially those forming the teeth, the remedy cannot be applied; the interstitial deposit cannot be corrected or reduced to a normal standard, and a stagnation is the result, which finally produces disorganization and decay.

These changes in the capillary circulation may not indicate distress in any of the larger organs, or their functions. The system may be entirely free from any diseased condition of the vital forces. But as the individual, standing upon the shore of a river, may drink in miasmatic poison from the grateful breeze that fans his over-heated and sweated brow, so may those hard unyielding organs receive the seeds of decay and death in the very flow of life and spirits which bring the glow of health and beauty upon the cheek by the extending walls of the capillary maze, which allow the red corpuscles of the blood to come to the surface by reason of an acceleration of the circulation.

It is rarely, indeed, that the diseases of the teeth can be traced to such delightful surroundings, or such fine robust conditions. But is the fact not apparent, at every step of scientific research, that the elements of life and death are not only running side by side continually thorough our veins and arteries, but that every step in life, and every phase of enjoyment, are beset with dangers which sometimes suddenly lead to the grave.

Here "*dental hygiene*" is at fault. The dentist, however skillful and thoroughly scientific, must stand abashed before these freaks and mandates of nature, and ply his skill in

...ed organ, or allow the work of
...course, and restore the function by
...se results do not flow from the
...erated, and consequently cannot
...ic treatment; but they confront
...perience in active practice, and,
...ention.

...implest definition of the idea of
...found in the phraseology, "*raise*
...ise a child or a tender plant.

...own to what might be termed a
...meet the demands of the economy
...nd agencies are concerned. This
...ward a good development of the
... maintain that the cause of decay
... outward character, this kind of
...ficient. To raise a child well, the
... all that is required. There are
...observance of which is not only
...owth of the system, but to regulate
... appetite, and a good mental and
... faculties are all necessary. Good
...g all the elements necessary to
...various tissues of the body—clean,
...the surface from the chilling blasts
...t-door exercise—all, with temper-
... not only raise the child well, but,
...es, *raise a denture* well calculated
... of life, and endure the wear and

...e out-croppings and freaks of na-
...ency to hygienic laws; but in the
...itions of observant and well-bal-
...munity can be so educated to gen-
...hrough popular sentiment, an im-
...physiological status of the race.
...d the art and mystery of destroy-

ing the human fabric. They seem to know what steps to take to run this magnificent structure into decay and death, but are slow—very slow—to grasp the idea of health and happiness.

The simplest way to raise a child well, *is to desist from abusing it.* Break in at once and forever upon those habits and fashions which are leading children, almost from lisping infancy, into the maelstrom of extravagance and dissipation. Resist the overpowering pressure of the baser and more vulgar customs of modern life, and yield to the surer and better dictates of nature, (if there is no other help at hand), and the work is done.

But, to raise a *regular, enduring denture,* is not always the work of unaided nature. A careful harmonizing of the conditions of growth with the principles of science and art, is the prerogative of our profession, and which should be exercised whenever there seems to be an inability in nature to perform its task.

In the finest and best developed forms the teeth often present themselves in most unsightly irregularities. In such cases the skill of the dentist must be brought into requisition, for, however strong in texture such teeth may be, their crowded condition will render them liable to disease from external causes.

A few thoughts in regard to the liability of teeth to decay from neglect and abuse, and the influence of acids and alkalies as they come up, either in the secretions of the mouth, in food, or by direct contact, and we are done.

The low vital power of the enamel renders it susceptible to great and lasting injury, where any of the last named reagents come in direct contact with it. It contains so small a per centum of animal matter that those strong poisonous substances destroy the vital principle, and leave the mineral structure a dead, disorganized mass of matter, which breaks away in the process of mastication, or shows signs of disintegration in black, decayed spots, or a discoloration of the enamel altogether. These evidences of decay often present

[illegible] corrosive action can take place;
[illegible] ernal injury must rest upon the
[illegible] composing agent, constituting,
[illegible] rect manner, the disease of this
[illegible] dies.

[illegible] e action can take place by the
[illegible] atter, or vegetable subtances,
[illegible] liva, when such substances are
[illegible] between the teeth, no one will
[illegible] t many teeth are destroyed from
[illegible] fact beyond controversy. But
[illegible] those elements are present, and
[illegible] nd more deadly reagents, before
[illegible] tact, the influence they exert is
[illegible]

[illegible] rst-class development, and there
[illegible] uses above enumerated present,
[illegible] be very slow in producing an
[illegible] enture, or even the decay of an
[illegible] s the practitioner of half a dozen
[illegible] not seen beautiful dentures, of
[illegible] spot or blemish, save a slight
[illegible] re the possessor can boast of his
[illegible] ten-penny nail? And this, too,
[illegible] ver having touched their teeth
[illegible] an and the German often present
[illegible] ey are rarely seen in the more
[illegible] n life.

[illegible] however, not without beautiful
[illegible] h, which, too, can be, and in the
[illegible] rved through care without a spot
[illegible] od of life, when, by a sloughing
[illegible] absorption of the integuments,
[illegible] d, and must be removed.

[illegible] and written about "*acids*" and
[illegible] in the food and condiments in
[illegible] Those deductions and conclusions,

we think, are strained and largely over-estimated. When mixed and baked, and boiled and cured, they come in contact with the teeth as entirely different chemical compounds, and their influence is no longer acid nor alkaline, but so mild in their effects, especially regarding the fact that they are held there so short a time, that very little injury can be caused by them.

Much of the distress, however, occasioned by all the above enumerated agents, can be prevented by a proper system of hygienic treatment. In order properly to meet all the contingencies necessary, and to comply with the suggestions of science, in the work of *raising* and *preserving* a good, enduring and substantial denture, the dental practitioner should have control of the process of dentition from infancy, and much of the manner of the child's living. The eruption of those organs should be an operation of special care, and when they are fairly developed, frequent inspection and good sanitary directions, with all the treatment, such as the nature of the case may require, and you meet, in a scientific way, all the mandates of what we understand by *dental hygiene.—Dental Times.*

MONTHLY SUMMARY.

Excision of Inferior Dental Nerve for Neuralgia.—Wm. J. C. æt. 22. This case is one of a very interesting character. The patient has had a violent form of facial neuralgia for three years. He has suffered great agony from the excruciating pain. Every attempt at talking, mastication, or deglutition, is attended with an aggravation of the symptoms. His life has become burdensome. His lips and cheeks are in constant spasmodic action. The expression of the countenance is denotive of pain. The angle of the mouth is constantly drawn over to the right side. The pain is more particularly severe along the right side of the upper and lower lips. Both the upper and lower teeth were extracted, without even temporary benefit. The pain is most severe when he eats. It very often wakes him at night. It is worse when the weather is wet. Every medical measure has been tried in vain.

...t the pain is confined chiefly to the ...al nerve, it is proposed to make an ...at nerve, curvilinear in shape, carry- ...physis of the chin, and to perforate ...king thus three, four, or five open- ...is nerve in its entire length. Prof. ...ration in a number of cases, and in ...relief. Inasmuch as all the ordinary ...have been tried in this case without ...bility is that the immediate cause of ...ed upon the nerve in the long canal ...The nerve itself is probably not dis- ... upon in the manner indicated. In ...e inferior maxillary artery will, of ... be ligated, and the flaps dissected ... the bone. Then, by means of the ... of the jaw-bone will be divided, and ...he seat of the disease.

...der the influence of chloroform, and ... the manner detailed. The wound ... suture.

...had no neuralgic pain since the opera- ...pelatous blush in the neck, which was ... of iodine. The extirpated nerve has ...ed, and no evidence of disease detec- ...herefore probable that the stream of ...by some pressure upon the nerve, giv- ...*urgical Clinic of Prof. Gross.—Med.*

...—Dr. Wm. Mason Turner, of Phil- ...*edical and Surgical Reporter*, that in ...œa season, the past summer, he used ...pium in decided doses, and in nine ...ent of this, seidlitz powder, rochelle ...r two good stools showing the action ...lly checked the bowels with vege- ...r spice plasters to the abdomen, and ...r, fancying he saw deleterious effects

from the calomel (his patients seemed suddenly to grow weak under its use) he immediately discontinued it, and without using the *mercurial*, or the *saline and anodyne* treatment, resorted *at once* to the vegetable astringents. He gave immediately, from three to four drachms of a mixture of equal parts of tr. opii, camphor, tr.camph., tr. zingib., tr. krameriæ and tr. lav. com., and in "an hour after, gave every two hours, half tea spoonful doses of above for six or eight times." By this method, he says, he treated some very bad cases, and with the most satisfactory results. "The bowels invariable are promptly checked; one day after the diarrhœa has ceased, open the bowels with some ol. olivæ, or the castor oil mixture. This practice may not be orthodox, but the stools are healthy and remain so; and orthodox or not, it is successful."

Consumption of Horse-Meat in Paris and Berlin.—The sale of horse-meat has not taken so well in Paris as might have been expected from the first success of the undertaking. We are informed by the official accounts, which have just been published, that during the last twelve months the number of horses slain in Paris amounts to 2400. Out of this quantity five per cent. have been employed in making sausages, etc., whilst forty per cent. have been sold to the small *restaurants*, and ten per cent. to the poorer classes. It may thus be seen that the quantity of horse-meat knowingly consumed as such in Paris is very small. Indeed, even the poorest people in that city manifest a strong aversion to horseflesh.

The number of horses slain in Berlin during the same period of time amounts to 4044, thus forming almost double the number slaughtered in Paris. But it may be well to add that the Berlin dyers are now making an extensive use of horse-blood.—*London Lancet.*

To Prevent Death by Chloroform.—Experiments on inferior animals show that they may be restored from apparent death from chloroform by the continuous galvanic current, the negative pole being put in the mouth and the positive pole in the rectum. In some cases the animal was left for two minutes in a state of apparent death and then restored.—*Med. Record.*

...*harton's Duct.* By John L. Fire-
...50, called on me with a tumor in
...the right side of the tongue, which
...le," as it interfered somewhat with
...deglutition.
...or was felt in the place designated,
...a hulled walnut, and on the floor
... was seen unusually open. A probe
...mediately below the surface struck
...oducing a narrow-bladed bistoury
...ith the tongue, and with the scoop
...a calculus 14 lines long; 8 broad
... weight. It was yellowish-white;
...d was composed of "phosphate and
...her by animal matter."
...robably of unusual size. Rokitansky
...tions, that they vary in size "from
...en that of a hazel-nut."—*Detroit*

...ffee is spoken of in high terms by
...er for the neutralizing of foul odors
...dies in a state of decay, as it can be
... disinfecting agents would be inad-
... die in the spaces between the floors
...dor arising therefrom can be effectu-
...nd or two of fresh burnt and ground
...or the purification of a sick room it
... burning rags, as it has a beneficial
...here of the room, and gives, besides,

...*r Local Application.*—As a substi-
...ggs reccommends in the *Lancet* the
..., one drachm and a half; glycerine,
...rinated lime, six ounces. Half an
... or eight ounces of water is used in
...re of iodine or chlorinated lime is
...erfectly colorless, and may be used
... in diseases with fetid discharges."

EDITORIAL DEPARTMENT.

Another Champion in the Field.—After a cessation of hostilities for some months, the war against the formation of a "Southern Dental Association" has been renewed by the appearance of a new champion for the opposition, one of the editors of the *Dental Register*, who, over the signature of "W." endeavors to conceal his vexation under the guise of humor. While he accuses us of feeling sore, he cannot forgive our omission of a foot-note he took the *liberty* to add to Dr. Morgan's article as published in the *Register*, and which we considered to be a reflection upon Dr. M's veracity.

We professed to give our readers Dr. Morgan's statement, and do not admit that we were under any obligation to add the comments "W." was pleased to make concerning it; the more so as we regard Dr. M's word to be as reliable as that of "W."

When one has so far succeeded in the accomplishment of a cherished object, that there is every reason for believing that success is but a question of time, there can certainly be no cause for the existence of any of the sore feeling so humorously depicted by "W." But we rather suspect that "W." with his usual foresight, has been for some time convinced that the formation of a "Southern Dental Association," was no longer a matter for doubt; hence the bitterness of the pill.

The Cause of the Suspension of the New York College of Dentistry—In the June No. of the *Journal* our readers were informed of the suspension of this institution; the following account of the trial, taken from a New York daily paper, will explain the cause of the injunction being granted which closed its doors: "This was an action brought by the Attorney General, in the nature of a *quo warranto*, to forfeit the charter of the Dental College of New York on the ground of misbehavior of the trustees. The chief charges against them were: disregard of their own by-laws, attempting to alter those by-laws irregularly in order to cover up such irregularity, and giving diplomas to four students who were not, according to their regulations, entitled to such diplomas.

There were besides some charges that officers of the College had used the provisions of the College, made for the charitable treatment of the poor, for their own gain. This, however, was not an essential point in the case. The main charge was the issuing of the certificates or diplomas to the young men at the last graduation. The purpose of the founders of the College seems, from their earlier rules, to have been to very largely increase the scientific requirements of dentists. Their first rules required

tudents, This was afterwards mod-
rk to count as time of study, and
ctual attendance at the College to
The charge is that, at the last ex-
young men who had not filled even
the regents of the University hav-
diplomas, an effort was made, in a
nd the by-laws to cover the case.
e is, that in so far as the faculty of
d on the representation of the dean,
elected, and is now the promoter of
fact, the young men were well pre-
xaminations; that the trustees did
nd have done nothing illegal, what-
d to do, and that their intentions

notion before Judge Cardozo, and
order was granted, and a receiver
provisional remedies.
r a reargument of the former motion
er orders, the defendant adding affi-
nore full and technical denials of the
peared by counsel before Judge Car-
el for the plaintiff, commenced his
about ten minutes, when Judge Car-
the bench. After waiting for his
minutes, the counsel after a short
eir papers to the clerk and left the

Boston Dental College.—In the July
rmed our readers that an injunction
s College, at the instigation of six
rustees, and that a hearing was ap-
19th, to see whether the injunction

e day appointed, and the injunction
action of the Court interferes with
e late graduating class, and to obtain
class will be compelled to attend
res. The charge which led to the
s, that the faculty intended to gradu-
attendance on two courses of lectures

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ARTICLE I.

Microscopy of the Teeth.

By S. P. Cutler, D. D. S., M.D., Holly Springs, Miss.

Read before the Southern Dental Association, July 30th, 1869.

In this article I propose noticing a few points of an article in the May No. of the *American Journal of Dental Science* entitled "Dentine;" copied from the *Medical Investigator*.

The main points in the article accord with my views previously published, other points differ widely. It is to try and ferret out all the facts possible on the subject of the microscopic anatomy of the teeth that I take the liberty to review some points in the above article. While I take this liberty I freely allow others to do the same with me at any time, as I am after facts only. On Page 38 and 9 the writer states that the pulp cavity for a short distance from the foramina of the roots towards the crown, is lined or covered with osteal cells or cementum. Now if this be so the tubuli must first pass bodily through these osteal cells or layer of cementum, and then enter the dentine, then after passing through the dentine the nerve fibrils must enter the cement again, thereby traversing two strata of cement and one of dentine in their course from the pulp before reaching the surface of the fang. Still further up the fang he does not claim that the pulp cavity is covered by or lined by cement.

How can this be possible, for one portion of the pulp canal to be lined with cement and the balance not? Is this in accordance with nature? Is this in accordance with microsopic teachings? It certainly is not what my glass teaches, as I never have seen an instance of the kind from a large number of observations. Now in case the interior of the pulp cavity being lined with cement in accordance with all other cases the cement so lining must necessarily be covered by periosteum, or pericementum, the same as is similar to the exterior of the fang. Has this been found also to be the case? Undoubtedly it has not, if so, this would constitute Nature's botchwork and not her wonted harmony in all things which is so wonderful. I speak of the rule not of exceptions. I do not know what freaks she may be guilty of in many instances, I speak of the rule not the exceptions, though as above stated I have never seen an exception of this kind. I have in my possession two specimens, given, one at Cincinnati by Dr. Cushing of Chicago which he believed to be a lining of cement up a short distance from the foramen, but on careful examination under my instrument, I found nothing but true dentine though more irregular than usual in this instance. Again, how can it be possible that the minute opening at the apex, only large enough to admit of the passage of nerves and blood vessels, to be lined with periosteum? It certainly is impossible.

If such a case were possible there would have to be a new osteal basement membrane superadded on the inside of the pulp canal after dentification had ceased, thereby changing the whole plan of construction first laid down as the plan of operations for tooth development which we certainly have no very good grounds for believing, In laying the foundation or basement membrane, which is the true builder under all circumstances of all organic structures, for the development of the teeth, there commences, according to Beall, a double process of development, one travelling inward by depositing layer after layer of germinal matter, forming dentine on the one hand, and outwardly on the other forming

enamel. Now passing downwards the same process may be recognized in neck and fang development, developing by the same basement membrane the dentine of the fang; but a different basement membrane to that of enamel is now laid down for the cement formation observing the same law of double development in the fang as in the crown, that is, commencing at the line of junction of cement and dentine where the enamel terminates one line of developmental march inwards the other outwards and downwards until the whole fang is fully developed and the tooth fully erupted. Up to this time the fang is open at apex and funnel shaped. By the time the tooth is fully developed the apex of fang begins to close up around the nerve pulp containing blood vessels, nerves and cellular tissue. By the time the apex is fully closed the dentine of the young tooth is fully completed for that period, the cement now having closed around the point of the fang down on to the pulp, as described above, but not following inwards, as, by this time, the door is closed and string pulled in, and no entrance here for foreign deposits of any kind. Up to this period there is but a thin layer of cement covering the fang uniformly, a few thicknesses throughout, but subsequently the cement gradually thickens at end of fang and on the fang for a third or more of its length with a regular taper, generally, no abrupt termination of additional layers of cells only in rare instances. We necessarily conclude that one basement membrane is not capable of building dentine, enamel and cement as they are all built upon separate and distinct types, and that a separate builder is needed for each. Hence a distinct basement membrane for each being in contact at the commencement of the osteal process, but continue to diverge or separate as the process of development advances and travels on *pari passu* until complete development. What other rational conclusion can we come to than that there is a separate and special basement membrane for each, two of which have no homologue in the system, that of the cement being common to other bones have homologous and non homologous basement membranes are

[illegible] elopment of teeth. As the cement [illegible] ge and in some cases from other [illegible] eolus necessarily gives way to the [illegible] s of the hypertrophied fang. In [illegible] ble to suppose that where the fang [illegible] that the resistance on the one hand [illegible] g force of the cemental growth.

[illegible] t seem to be the case under all cir- [illegible] the bone gradually yielding before [illegible] he progressing fang development. [illegible] his was done; the rational answer [illegible] absorption, and here again we ask [illegible] e? Can we suppose that the bone [illegible] ved and the same bone material so [illegible] the periosteum and deposited on [illegible] ng, we must conclude that on the [illegible] ved and carried out of the system, [illegible] deposits from food in the form of [illegible] d as in another. or similar to other, [illegible] on a small scale and under different [illegible] n a similar type and plan. The ab- [illegible] I believe to be the work of an acid [illegible] lime which is washed away by the [illegible] from the system mainly by the kid- [illegible] no doubt being induced by the new [illegible] it may depend on a removal of the [illegible] t from some obscure cause than by [illegible] e fang development induced from [illegible] sening and ultimate loss of tooth; [illegible] mer hypothesis may be the most [illegible] s relating to bone absorption being [illegible] en or dentine and an acid on the [illegible] published and need not be repeated [illegible]

[illegible] Some tubes give off no branches but [illegible] anner without branching until they [illegible] the enamel." Here I shall again

take issue, as no solitary tube having pulp cavity that does not branch one or more times just before entering the base of the enamel, forming what have been termed coronal branches. No properly prepared specimen but will show these branches distinctly under a good instrument, which fact also has been published by myself in a former article. Page 40, says: "There is an intertubular substance in dentine which is wholly composed of lime salts. These territories are without sensation. There are no fibrils there."

Says: "In dental decay we find portions of the cavity very sensitive to the touch of an instrument and other parts totally without sensibility." Does the writer here mean that the regions between the tubes are without sensibility and that the tubes themselves are all sensitive? If so, how is it possible to define these regions with an excavator when the tubes are probably not more on an average than the one five thousands of an inch apart, or even admit that they are the one thousand of an inch apart for sake of argument, how is it possible to trace out these distinctions along the meandering tubes with an excavator, say even the very smallest, which would more than cover on its cutting edge two or may be half a dozen of tubes and intertubular spaces at once. Such being the fact, I am unable to fully comprehend how any person can by any amount of training sharpen his sense of touch so as to make such nice discriminations, it certainly is a mystery to myself. I admit that some portions of cavity of a decayed tooth are frequently more sensitive than other portions in cases of exalted sensibility. These regions are just under the enamel, and in such the cement where the branches are most numerous, small and nearest the distal extremities or terminal points where sensation is most acute. This fact is not confined alone to teeth, but equally applies to all other sensitive regions of the body. The dentinal nerve fibrils through the whole course of the tubuli may be regarded as terminal fibrils capable of receiving throughout similar impressions or functions as each fibril stands separate, hence terminal throughout after leaving the pulp cavity.

[illegible] the nerve fibrils may be regarded [illegible] nen, and they are all through the [illegible] ted though in close proximity in [illegible] ulp from plexuses filled and inter- [illegible] ne. Not so in any other nerve cord [illegible] parallel and in close contact, and [illegible] ma quite unlike the pulp membrane. [illegible] brils are the true functional points [illegible] sciculi or leashes constituting the [illegible] nning from nerve centres to termini, [illegible] rriers or conductors of force only [illegible] rods or wires of a battery tne ter- [illegible] those of greatest disturbance. No [illegible] or given off by the main trunk of [illegible] distal or points of filamental termi-

[illegible] d of arteries and veins, it is only in [illegible] ere vascular physiology takes place [illegible] guinis and oxygen, on the one hand [illegible] nutrition, and the products of waste [illegible] vessels to be carried out of the or-

[illegible] vital points, and where both nerve [illegible] d vessels most generally meet with [illegible] he dentinal nerve fibrils and corneal [illegible] miliar examples. Here also nutri- [illegible] ned. On page 40, the writer further [illegible] story of dentine shows that a tooth [illegible] dead, (*and removed from the tooth*) [illegible] dental tubes anastomose with the [illegible] ntum and the cementum cells are [illegible] steum of the roots with which they

[illegible] ration has taught us that a tooth may [illegible] moval of its nervous pulp the dentine [illegible] proving extremely sensitive to the [illegible] n some instances, thus showing the

presence of nerve fibrils received from the periosteum or dental periosteum.—*Medical Investigator.* Right here I take issue with the writer and deny the whole thing, and shall attempt to prove my position by the writers own *statement.* On the same page here is what he says: "There is an intertubular substance in dentine which is wholly composed of lime salts. These territories are *without sensation. There are no fibrils there.*"

Now let us analyze the conflicting statements He argues that the regions or spaces between the tubes have no nerve fibrils and no sensation. Now as there are no anastomosing of tubes, at least in the crown, or, in any that terminate under the enamel, how is it possible for sensibility to be transmitted from the dental periosteum when he admits the removal of the entire pulp? How is it possible for sensation to pass from the dental periosteum up through these regions of non-sensibility as no normal dentine will show any anastomosing with tubes ending under the enamel? How then is it possible when the nerve cavity is empty? It will be seen that the writer here contradicts himself. There must be some error somewhere in diagnosis. I am fully satisfied that when a nerve is killed or dies a natural death and has been removed bodily from the pulp cavity, the dentine at least of each tooth is *entirely* dead. The cement in such cases may retain sufficient vital connection with the dental periosteum to retain the tooth in its place for an indefinite period, without in many cases giving further trouble. I would recommend a careful repetition of the above cited cases on the part of the believers of this doctrine, then publish results.

We find regions in the most sensitive forms of decay where, even just under the enamel where a tooth is most generally sensitive, wholly devoid of sensibility, this can be readily accounted for from the fact that the more sensitive region have no live fibrils, their connection with the pulp having been removed by decay; where the microscopic anatomy of dentine is fully understood there need be no mys-

tery connected with this fact. There is no true ganglia or gray matter found anywhere in the pulp of teeth, only fibrilla plexuses, heretofore described in a former article.

The dental branches, at least of the trigemina are both nutritive and sensorial the nearest ganglia to the teeth being Meckles and very small, the next and largest being within the cranium, the Casserian which furnishes general sensibility to the whole nerve, so that the dental are the most sensitive of the branches of this nerve.

Now let us take a retrospective view of pulp fibrils. beginning at the apex of fang. First.—Observe fibrils forming a central plexus through the pulp, these minor lateral ones which have heretofore been minutely described. Next observe those fibrils filled in and surrounded with soft cellular tissue throughout the pulp. Next observe fibrils passing through pulp membrane into cavity filled with fluid only *liquor sanguinis*. Next observe some fibrils passing this fluid into dentinal tubuli, ivory portion of tooth harder than bone. Now observe some fibrils passing through tubes in dentine through a nameless region, a *terra incognita* or *No Man's Land*, where the dentine and enamel unite by the remains of original basement membrane where ossification first commenced. Next observe fibrils terminating just into the base of enamel in a *cul de sac*. Next observe that after fibrils leave the pulp no anastomosing takes place anywhere in such as terminate under enamel and seldom in fang. Next observe fibrils not terminating under cement as in case of enamel, but passing bodily through to surface membrane. Now take into consideration the various media the dentinal nerve fibrils pass through and occupy, varying so widely in density and structures, and we find the anatomy and physiology of the teeth to be perhaps the most wonderful of all structures, when we consider the almost exclusive use of these organs to be mechanical and laborious, simply a set of grinders and cutters or choppers, in short "hewers of wood and drawers of water," which may be replaced by artificial substitutes quite successfully.

ARTICLE II.

The Circulation.

By N. M. Burkholder, D.D.S.

The blood is the life of the body. The circulation of it throughout the system is necessary to life, to the performance of the functions of nutrition and secretion, in that it gives to all the tissues a constantly renewed supply of the materials which they severally require in order to growth—development, and also provides through its channels a means of escape for those excrementitial matters, which are the constant result of the decomposing tissues. The different structures require different materials. The muscle, for instance, wants fibrine, the nerve, fatty matter, the bone, gelatin and earthy salts, the nutrition of the milk cells during lactation separates albumenous, fatty and saccharine substances and so on, and we observe that the blood when returning from the different organs through which it has been transmitted, has undergone very different changes, according to the requirement of the organ or tissue which each current has supplied, and if the same portion of the blood were being constantly transmitted to each organ, on its return, its composition would speedily undergo a change, which would render it useless, but by the general circulation or commingling of all the smaller circulations, before the blood is again propelled by the central organ outward to the tissues, this change is prevented and the supply of nutritive material, which the blood has been robbed of, is again restored by the transformation of albumen by the aid of the lymphatics and, mainly, by the continual supply of chyle and oxygen.

Again the living body is subject to perpetual change. Death commences the first moment of our existence. Chemical laws rule without intermission, and all the exhibitions of life are but the result of chemical or chemico-vital change. An innumerable play of affinities surrounds us, theirs is the grand ruling law of the universe, unchangeable and unre-

...laws we have no *growth*, no *decompo-* ...are but a compound of elements, ...ith these laws, presided over, how- ...Principle, the essential nature of ...matter, *who is able to understand?* ...lements which help to make up the ...er carbon. Oxygen is being contin- ...bination with other elements, from ...vehicle for the escape of carbon in ...id gas, the retention of which is in- ...of the nervous system. Therefore ...sh oxygen is required for the life of

...ratus in the air cells of which the ...ere meets with the blood, which ab- ...carbonic acid, which the ablest phys- ...day consider a result of the decom- ...es, and not, as has been supposed, a ...xidation of carbon. Here then is ...rposes of the circulation, in the con- ...ectly to the tissues, to the ultimate ...appropriation and for their develop- ...way of carbonic acid, resulting from ...ormed material or the decomposition ...now excrementitial. All the excre- ...sulting from the decomposition are ...wonderful current, some to be elimi- ..., some by the kidneys, some by the ...g directly through the skin, each by ...l often performing functions on the ...her vital processes, which (functions)

...fly notice the natural eye appearance ...urrent which having passed through ...ngs and there parted with its carbonic ...f with oxygen and passing into the ...s thrown out to feed the tissues, is

found to have a bright scarlet color and is called *aerated*, oxygenated or arterial blood, after passing through the great capillary system of vessels, it is found in the veins and right side of the heart, beyond, to have a dark purple (and almost black) hue, and this is characteristic of impoverished blood, an absence of oxygen and a heavy freight of carbonic acid. These are mere facts, and when we are asked how the oxygen combines with the globules, albumen, salts, &c., we have only to say *it is not known.*

In the higher forms of animal life we find an apparatus for the circulation, which, in its nature, is as complicated as it is wonderful. In the vegetable world and by consequence in the lower classes of animal life, which possess but little higher expressions of vitality, we find a circulation of the most simple and rudimentary form. The nature of the force by which the circulation is carried on in any of the higher plants, can be easily learned upon minute examination. Those who have studied these things tell us there is an ascending and a descending sap. This ascending sap consists chiefly of water which holds various substances in solution and has been absorbed or taken up by the soft sponge-like rootlets. The laws of capillary attraction explain this movement, in part, as its *vis a tergo.* We see this power of forcing up a column of sap very readily when we cut across the stem of a vine or plant in which the sap rises rapidly and which is in full bloom or leaf. This powerful "vis a tergo" has been estimated at from 15 to 40 lbs. to the square inch, but there is also a condition of things on the reverse side, which not only aids, but which is the chief force upon which the circulation depends, and this is the nutritive force generated by the chemico-vital changes taking place in the performance of the nutritive function. Light and heat—physical conditions are necessary—they stimulate the exhaling process by which the watery portions of the ascending sap are thrown off. Darkness and cold check this exhalation and of course check the absorption at the lower extremity, these with others are modifying influences only.

... the fluid in question to the chyle,
... ending sap, may be strictly com-
... als. The carbon which has been
... e leaves, in combination with
... ns with the remnant of the as-
... ion has taken place, a gummy
... ready to be appropriated by and
... re and is conveyed by a network
... and chiefly downwards to the

... een certain particles of the nu-
... matter through which it flows.
... raction of these particles towards
... hese particles satisfy the body
... accordingly lost, they pass on
... orce which attracts particles ever
... ment may be onward or backward,
... course, very much influenced to
... cise etc. In all the capillary net-
... ed in this manner by what we
... *ic action.* If we personify the
... a grand market, in which the
... or instead of person seeking food,
... rson.

... e no need of a central propelling
... ll the fluid seems to be appropri-
... which it has circulated; neither
... oxygen. In some of the lower
... n one stage of man's primary or
... circulation very nearly alike to
... ese comparisons the one wide dis-
... able and animal circulation, viz:
... rculation in the vegetable world
... n the animal it has the additional
... stated, of conveying to the exte-
... ntly decomposing tissue. Now,
... al life, we have no blood vessels,

just as we have no sap vessels in the sea weeds, the whole substance possessing nearly the same degree of absorption is nourished by direct absorption, as also in the first stage of the embryonic state of man. Coming a little higher in the scale of animal life, we find vessels of circulation, the fluid governed in its movement by the changes resulting from the performance of the functions of growth, secretion, &c., as already mentioned.

In other words to express the law:—

Growth—Development is the power inherent in the germ, it is this which gives it its individuality, and granting the possession of this power, we necessarily acknowledge and include the truth of the following theory: "Wherever blood is necessary, a flow is set up by laws of a vital or chemico-vital nature."

Now, in the human embryo, the primitive germinal granule, possessed of an individuality which nothing can change, this power of development under certain conditions, the basis of all vital influence, forms its vessels, it is said, by the aggregation of cells, in which the first blood seems to be formed. These vessels are first formed in a membranous expansion or covering which surrounds what we call the yolk (of the egg) which serves as a sort of temporary stomach, and capillaries are first formed necessarily, being all this condition requires, fine and almost imperceptible lines of red shooting across this membrane. After a short time larger trunks appear by the union of the smaller. The first direction of the flow (visible) is to the germinal centres, where the little organism is working away silently yet continuously toward her wonderful destiny.

Higher and higher in the scale of organic life, rises this little wonder and the young heart has not yet become muscular, when the blood begins to flow in by a union of the vessels, towards where we afterwards find it located. We now see that the heart is the child of the blood. The old theory that the heart was the sole supporter of the circulation has long since exploded and we know that the heart is

[illegible] ed by the organism. In some of [illegible] l life, the Hydra for instance, we [illegible] ed by a heart, lungs and stomach, [illegible] hollow sack higher up in the rep- [illegible] e common ventricle of which all [illegible] gain sent forth. In the fish we [illegible] art, the blood after being aerated [illegible] to the heart to be thrown out to [illegible] ut passing immediately from the [illegible] stem, another indisputable proof [illegible] ction. This is purely a single or [illegible] us stop tracing the development [illegible] look at it in its highest possible [illegible] determines the limits of all liv- [illegible] heart secures a double circulation [illegible] two distinct parts, viz: a systemic [illegible] respiratory or venous heart, the [illegible] tter its right side, each part has a [illegible] e auricle and an impelling cavity [illegible] se two sides (except in fœtal life) [illegible] other. The position of the heart is [illegible] th ribs, impulse felt two inches to [illegible] hangs pointing to the left, resting [illegible] on of the diaphragm, the base, or [illegible] ssing upwards and to the right and [illegible] to the left, between the two layers [illegible] d in a fibro-serous membrane called [illegible] n five inches, breadth three, thick- [illegible] in males ten to twelve ounces, [illegible] nces. The doorway between the [illegible] guarded by valves to prevent re- [illegible] n the right auricle and ventricle [illegible] e from their shape, those between [illegible] icle, the mitral valves for the same [illegible] he aorta and pulmonary artery we [illegible] he semi-lunar. Two large venous [illegible] uricle, one descending, the other

ascending called the superior and inferior vena cava respectively. The former enters in such a direction as to pour its current directly into the auriculo-ventricular opening, the latter, however, pours its current into the posterior inferior portion of the auricle, against the septum between the two auricles at the point, the "fossa ovalis," at which, in the fœtus, it passed through a foramen, the "foramen ovale" into the left auricle, is mingled with the other current and passes into the right ventricle, from which cavity the black carbonated blood, is impelled through the pulmonary artery to the lungs and in its passage through the capillaries of which, having thrown off its carbonic acid and being loaded with oxygen, it returns by the pulmonary veins to the left auricle, thence passing into the left ventricle, is impelled through the aorta and its branches outward on its life giving mission. These are all the vessels of this organ except those which nourish its own structure called the coronary vessels. The ductus arteriosus we shall notice when we come to speak of fœtal circulation.

In regard to the structure of the blood vessels, 1st, The arteries have an external condensed layer of alveolar tissue. (2) Elastic tissue. (3) Circular arrangement of the muscular around the tube. (4) Brittle, polished, thin membrane pierced with minute foramina. (5) Tesselated epithelium. In the large arteries the elastic coat predominates, further out the muscular coat gets the advantage of the elastic, and in the capillaries, that great network of minute canals, the thin semi elastic basement membrane is its only investment and is extremely thin, having lost all the others. The veins have more muscular coat than elastic, they have valves opening towards the heart strengthened by the smallest quantity of fibrous tissue; veins in their natural structure will sustain a pressure which will rupture the arteries. The force of the circulation in the aorta is 4 lbs. and 4 ℥, and said to be about 1-12th that force in the veins. The relative rapidity of its current compared to the veins is as 12 to 8. The blood is not forced to the arterial terminations by the simple

force of the heart by any means, but the elastic coat of the aorta first and on being distended by the column of driven blood, recoils and contracting upon its own volume, propels the current onward, in regular wave like currents to the arterial ramifications when the osmotic action of the capillary system assumes partial if not entire control of its movements, and in which *mysterious vale* the chemico-vital processes nutrition, secretion, etc. are carried on,

Let us return to the question of osmosis and examine the point somewhat by way of proof, promising to be very brief.

We know that the blood in the capillaries of the lungs gives out carbonic acid and absorbs oxygen, and that in the systemic arteries and capillaries it gives out to the tissues part of its oxygen and takes up the carbonic acid. Now if either of these changes be stopped, a complete stagnation of the blood will very soon take place, a damming up of the blood in the arteries, and, per necessity, a laboring action of the heart. If then oxygen be readmitted the movement will be renewed, provided that this suspension has not been too long continued. We may undoubtedly explain this by the laws of affinity, for the blood containing oxygen which the tissue requires, must possess greater affinity for the tissues than the venous blood which has given up its oxygen and hence we find the venous being continually pushed on ahead as the attraction of the arterial presses on it from behind, and once this arterial current fails to receive oxygen in the lungs it no longer possesses the affinity necessary for the production of this movement, hence the stagnation, caused by an absence of the osmotic action of the capillaries.—Another proof is incontestibly shown in the distension of the right side of the heart and large communicating vessels and partial vacuity of the reverse or arterial side, after death in certain cases, caused by the drain of the blood after saumatic death by osmotic force through the capillary system and which has entirely ceased at the time of rigor mortis. The reverse phenomena would most surely obtain if it

were true that the force exerted upon the blood by the heart was sufficient to explain the entire phenomena of the circulation. The complexity of affinities is the explanation for the complexity of movement in the capillaries.

To be Continued.

ARTICLE III.

Southern Dental Association.

Minutes of the Meeting of the Delegation of Southern Dentists held at Atlanta, Ga., July 28th, 29th and 30th, 1869.

By Jno. G. Angell, D.D.S., Recording Secretary.

A number of Southern Dentists met in Atlanta, Ga., for the purpose of organizing a Southern Dental Association; and the City Hall being tendered to them to hold their meeting they met in that building on the morning of July 29th, 1869.

The meeting was called to order by Dr. W. T. Arrington, of Memphis, Tenn.

On motion of Dr. C. A. Jordan, of Huntsville, Ala., Dr. Jas. S. Knapp, of New Orleans, was elected temporary President of the meeting.

On motion of Dr. W. T. Arrington, Dr. W. H. Morgan, of Nashville, Tenn., was elected Temporary Vice President, Drs. F. J. S. Gorgas, of Baltimore, Md. Temporary Secretary, and John G. Angell, of New Orleans, La. Assistant Secretary.

Dr. Morgan moved then that if it was the sense of the convention here assembled, we proceed to organize a Dental Association, which was carried by a unanimous vote.

On motion of Dr. W. T. Arrington a committee of three was appointed to draft a Constitution and By-Laws for the Association, consisting of Drs. Morgan, W. T. Arrington and W. G. Redman, of Louisville Ky.

On motion of Dr. Morgan the following gentlemen were added to the committee: Drs. W. S. Chandler of New Orleans, La.; F. J. S. Gorgas of Baltimore and Thos. J. Jones, of Sparta, Ga. The committee then retired.

The following communication was read before the Con-

...he Convention are respectfully
...Medical College during their
...s continue from 8 to 12 o'clock
...on. Signed, J. G. Westmore-

...d views upon the object of the
...he status of a delegate to be-
... was thus occupied until the
...d By-Laws appeared with their

...a constitution, which, on being
...e to be subsequently adopted

...cle 1st and 2nd were adopted as
...t with so many objections, that
...ve minutes to give his views,
... so much dissatisfaction about
..., on motion of Dr. Morgan, re-
... with instructions to report at

...n, the convention continued to
...cles of the constitution which
...e convention then adjourned

...ON SESSION.

...to order by Dr. Jas. S. Knapp,
...ber adjournment.
...itution and By-Laws not being
...f Dr. Angell the Code of Ethics
...tion during their absence, and
... as a whole. The Committee
...s appeared, and not being able
...ations for membership reported
... in the proceedings of the meet-
...balloted for and received three-
... motion of Dr. B. F. Arrington
... was received and laid on the

table. The following resolution was then offerred and accepted as a substitute to Articles 3. and 4.

Resolved that membership in this Association shall consist of such only as shall have received a degree in Dentistry or Medicine, and are engaged in the practice of Dentistry, or those who shall have been engaged in the practice ten years prior to the present time and received a three-fourth favorable vote of the members present to elect.

On motion of Dr. W. T. Arrington, the Constitution as a whole was adopted. The meeting then adjourned until eight P. M.

NIGHT SESSION.

As per adjournment the convention met at 8 P. M. and was called to order by the President, Dr. J. S. Knapp.

On motion of Dr. J. G. Angell a recess of one-half hour was granted to give the delegates an opportunity of signing the constitution and pay their initiation fee. The following are the names of the delegates who signed the Constitution and paid their fee :

Jas. S. Knapp, D. D. S., M. D., New Orleans, La.; W. H. Morgan, M. D., D. D. S., Nashville, Tenn.; W. T. Arrington, D. D. S., Memphis, Tenn.; J. R. Walker, D. D. S., N. Orleans, La.; H. Marshall, Atlanta, Geo.; W. S. Chandler, D.D.S., New Orleans, La.; Samuel Rambo, M. D.,D.D.S., Montgomery, Ala.; Henry A. Lowrance, Athens, Ga.; Arthur W. Ford, Atlanta, Geo.; R. A. McDonald, Griffin, Geo.; J. P. H. Brown, Augusta, Geo.; Thos. J. Jones, D. D. S., Sparta, Geo.; H. I. Henry, Covington, Geo.; J. A. Tigner, Fort Valley, Geo.; Edwin W. L'Engle, D. D. S., Savanah, Ga.; W. G. Redman, D.D.S., Louisville, Ky.; S. G. Holland, Augusta, Geo.; Jas. M. Day, Aiken, S. C.; T. W. Hentz, Columbus, Geo.; H. A. McDaniel, D.D.S., Huntsville, Ala.; F. Y. Clark, M.D.,D.D.S., Savannah, Geo.; C. A. Jordan, Huntsville, Ala.; H. D. Boyd, Troy, Ala.; J. G. McAuley, Selma, Ala.; J. D. Thomas, Atlanta, Geo.; W. J. Burr, M.D., Madison, Geo.; T. J. Crowe, Macon, Geo.; B. F. Arrington, D.D.S.,M.D., Wilmington, N. C.; Albert Hape, D.D.S., Atlanta,Geo.; F. J. S. Gorgas, D.D.S.,M.D., Baltimore, Md.; E. B. Marshall, Atlanta, Geo.; C. D'Alvigny,

[illegible] en, Marietta, Geo.; Wm. Rey-
[illegible] Augspath, Helena, Ark.; B. B.
[illegible] Jno. Fouchè, Knoxville, Tenn.;
[illegible] Tenn.; Jacob Fogle, Columbus,
[illegible] , Geo.; Jno. G. Angell, D.D.S.,
[illegible] Friedrich, D.D,S.; New Orleans,
[illegible] nta, Geo.; J. T. Campbell, Atlan-
[illegible] Griffin, Geo.; J. W. Wiley, New-

[illegible] ned the constitution the meeting
[illegible] e election of officers and Com-
[illegible] , resulted as follows, after much

[illegible] Arrington, of Tenn.; 1*st Vice*
[illegible] ds, of S. Carolina; 2*d Vice Pres-*
[illegible] Arkansas; 3*d Vice President*—
[illegible] bama; *Corresponding Secretary*—
[illegible] aryland; *Recording Secretary*—
[illegible] ouisiana; *Treasurer*—Dr. W. G.
[illegible] *Executive Committee*—Dr. W. H.
[illegible] *airman;* Dr. J. S. Knapp, Loui-
[illegible] r, Louisiana; Dr. J. R. Walker,
[illegible] eorgia.

[illegible] nstalled, the president stated that
[illegible] business.

[illegible] an the Association went into an
[illegible] convenient and suitable for the
[illegible]

[illegible] vannah, Augusta, Baltimore, Col-
[illegible] New Orleans were recommended
[illegible] or each, but after due discussion,
[illegible] or of New Orleans, La.

[illegible] tion and By-Laws were continued
[illegible]

[illegible] etary read communications from
[illegible] F. McLain, of New Orleans, La.;
[illegible] , Ky.; W, L. Burton, Sec'y Rich-

mond D. A., and W. W. H. Thackston, Farmville, Va., all expressing their regrets at not being able to attend the convention, and the assurance that we had their warmest sympathies and best wishes for success. The letter of Dr. W. W. H. Thackston was ordered to be spread upon the minutes of the meeting.

MORNING SESSION, THURSDAY 29TH.

Meeting was called to order by Dr. W. T. Arrington, the President in the chair.

No other business occupying the attention of the meeting the President appointed the following Committees:

On Membership—Drs. J. S. Knapp, La.; T. J. Jones, Ga.; G. J. Friedricks, La.

On Publication.—Drs. W. S. Chandler, La.; J. R. Walker, La.; J. G. Angell, La.

Dental Education.—Drs. F. J. S. Gorgas, Md.; J. P. H. Brown, Ga.; W. M. Reynolds, S. C.

Physiology and Surgery.—Drs. F. Y. Clark, Ga,; S. Rambo, Ala.; John Fouchè, Tenn.

Dental Chemistry.—Drs. J. G. McAuley, Ala.; W. H. Burr, Ga.; E. M. Allen, Ga.

Histology and Microscopy.—Drs. W. T. Arrington, Tenn. T. J. Jones, Ga.; John G. Angell, La.

Dental Therapeutics.—Drs. F. Y. Clark, Ga.; G. J. Friedericks, La.; H. Marshall, Ga.

Operative Dentistry.—Drs. W. H. Morgan, Tenn.: J. Fouchè, Tenn.; H. A. Lowrance, Ga.

Mechanical Dentistry.—Drs. W. G. Redman, Ky.; E. W. L'Engle, Ga.; S. G. Holland, Ga.

Dental Literature.—Drs. J. P. H. Brown, Ga.; H. A. McDaniel, Ala.; T. J. Jones, Ga.

Voluntary Essays.—Drs. J. R. Walker, La.; J. M. Day, S. C.; W. S. Chandler, La.

The President having appointed the various committees and the election of members being in order,. the following gentlemen were elected honorary members of the Association:

... olly Springs, Miss.; R. Arthur, Balti-... V. H. Thackston, Farmville, Va.; T. ... ofs. Samuel Gross, Philadelphia, Pa.; ... Orleans, La.; Paul F. Eve. Mo.; S. H.

... rship being closed, Dr. Morgan read ... Cannine relating to his experience in ... ork. He wished other dentists to be ... rience, as Rose Pearl did not serve ... d by the author. The communication ... ed to Committee on Mechanical Den- ...

... hen instructed by the chair to furnish ... rious committees a list of the names ... which they belong with the proper ...

... of Augusta, Geo. read an able Essay ... of the Dental Profession, which was ... to Committee on Voluntary Essays. ... of Nashville, could not agree with ... three of his statements. He did not ... tact he referred to, and ignored the ... born a Dentist. The development of ... ded upon his education. That some ... ter ability for one thing than another ... that was the result of the brain. He ... ber a curse to the profession, it was ... was the means of giving them an op- ... g the resources of the mind.

... as afraid Dr. Morgan had not under- ... the previous day. He "meant" that ... suited to one position than another, ... not make good dentists if they tried ... en had better turn their attention to ... d to them.

... n, was much pleased with Dr. Brown's ... d to hear scientific articles, but he re-

gretted the latter part of his article, and hoped it would be erased, if it should be published. He did not think there were too many Dental Colleges, if they were properly located. He had conversed with Professors of all the Colleges except St. Louis, and he believed it was our duty to bear with these institutions and not discourage students from attending them, but encourage them to take a degree in some college; the time was coming when it would be necessary to have it.

Dr. Brown, could not see any objections to anything in his essay, thought we would be better off, if there were fewer schools, the community could better support them. The professors would be better paid, and they would devote more time to lecturing than when not properly remunerated. The schools could have a more extensive museum and chemical aparatus. A man cannot be a dentist unless he has some mechanical talent, and some men may possess talent in a higher degree than others.

Dr. Morgan, said that the Association did not endorse all papers received and was not responsible for what they contained. Thought the number of schools were an advantage rather than a disadvantage. In 1847 there were only two schools with a very few scholars in the United States. Now there were eight schools and over five hundred students. He believed every man with a sound mind had some mechanical turn, and that it did not require a man of superior genius to become a good operator.

Dr. Brown, replied that in 1847 only two schools being in existence was owing to the low state of the profession.

On motion of Dr. Morgan the discussion was closed.

Dr. Jas. S. Knapp, read an Essay from Dr. A. F. McLain of New Orleans, La., on Prophylaxis or Prevention to Dental Decay.

On motion of Dr. Angell it was received and the subject discussed.

Dr. Reynolds of South Carolina, said he had never listened to a paper with more satisfaction. It was filled with truth,

[illegible] lded but the easiness these princi- [illegible] to the parents.

[illegible] at go to making teeth are not eaten, [illegible] made from the mothers. Give the [illegible] ted wheat bread or barly. If we [illegible] g gestation of the mother and bring [illegible] will have good teeth. The Scotch [illegible] they have nourishing food.

[illegible] for a moment as the committee on [illegible] hat it would cost $6 for fifty carte [illegible]

[illegible] app the report was referred back to [illegible] ructions to act upon the group.

[illegible] F. Arrington it was resolved that [illegible] red us with their presence and Mr. [illegible] group.

[illegible] McLain's paper was resumed. Dr. [illegible] rleans thought it was an able paper, [illegible] not to repair damages but to go to [illegible] ty and see if our patients had proper [illegible] nstances where improvements have [illegible] ng nutritious food. Dr. Morgan said [illegible] ned against biting hard substances. [illegible] cautioned against not biting. They [illegible] d and give exercise to the teeth.

[illegible] he was much pleased with the essay, [illegible] the cause of the disease before we [illegible] eved the real cause of diseased teeth [illegible] nproper development of the child, [illegible] in children, extending sometimes [illegible] f parents had no teeth the children [illegible] ame. Indians had good teeth; their [illegible] s well developed about 1 or 1½ inches [illegible] ield hands among the negroes were [illegible] itchen bad teeth are caused by the [illegible] ot food. Animals fed upon the re- [illegible] urned out to pasture would die, be- [illegible] teeth to masticate. Emigrants are

well developed and have fine teeth. Fashionable circles have artificial teeth and deformed jaws, quite contrary to the more humble class. Felt it ought to be made plain to the people, that nutritious food, proper cleanliness and use are essential to good teeth. Thought that defect in many teeth was caused by Physicians lancing the gums of children teeth.

Dr. Knapp thought when children teeth were ready to erupt, the enamel was too hard to be defaced or indented by the lance and that the defect referred to by Dr. C. was caused by sickness of the child during the formation of the teeth.

Dr Reynolds coincided in Dr. K's views.

Dr Clark said the crack or mark left by the lance was different from that of sickness and could scarcely be observed at first.

Dr. McDaniel considered the subject of great importance and felt we should give it special attention as it had been to entrusted to the medical adviser.

Dr. B. F. Arrington wished to express his appreciation of the paper, but thinks we were going behind our profession. Thinks the medical fraternity ought to attend to the constitution of the patient, our duty is to prepare ourselves for treating these diseases when they appear. Believed that it is our duty to watch over children's teeth entrusted to our care.

Dr. Day felt much interest in the paper and was confident it contained much truth as he had seen the benefit of its advice to some of his patients.

On motion of Dr. Morgan the discussion was closed.

Dr. Gorgas read a deep and scientific essay on "Microscopy of the Teeth," by Dr. S. P. Cutler of Holly Springs, Miss. On motion of Dr. Knapp the thanks of the Association were tendered to Dr. Gorgas for the able manner he read the article.

Committee on Photographs reported that pictures of the group would be taken by the artist 11 x 14 at 9 o'clock Friday morning at $2.50 each.

culiar piece of mechanical plate
rn by General Oglethrope. The
t at 8 P. M.

N, THURSDAY 29TH.

der as per adjournment at 8 P.M.
he President, in the chair.
journ this session of the Associa-
Friday, July 30th, 1869. Car-

Arrington, Dr. Knapp was ap-
e to draft complimentary resolu-

uley the subject of alveolar ab
sed teeth was discussed.
pon for his experience, for brevity
hree cases which he thought would
a certain extent.
rve has suppurated but no abscess.
ble with this class than with any
h to remove the nerve and fill the
always gave trouble on being con-
atisfactory answers to his investi-
uble was caused by using unsuita-
ng up the foramen. He usually
nging out the cavity thoroughly
out with creosote the second, and
re not to stop up the foramen with

ere is a fistulous opening, they are
rouble to treat. He syringes out
es as much decay as possible, tak-
oramen, then with the best instru-
on, pump creosote into the cavity
the fistulous opening. Continue
oth is in a healthy condition, then
en with gold taking care not to

Third class. The nerve is not entirely destroyed is very sensative, bleeds freely. He removes the nerve and after twenty-four or forty-eight hours applies creosote, and at third sitting fills the cavity.

Dr. B. F. Arrington, thinks bees-wax is the best material in the root of a tooth, it flows where you cannot put anything else, it is indestructable and fills the entire cavity. Next to wax is Os-Artificial, considers this better than cotton.

Dr. Augspath of Arkansas, said he had used Os-Artificial in his practice for eight years past for root filling and had been very successful.

Dr. Morgan referred to diseased teeth in the same order as Dr. Clarke. He agrees with Dr. C., that with the first class, there was always after trouble. He removes all decay and treats with creosote. Thinks trouble is caused by clogging up the foramen. When seriously apprehending an abscess following his first operation he applies the compound tincture of Iodide of Potassium on the gum over the root inside and out, treats sometimes several weeks. Sometimes fills the root with wood but prefers gold.

Second class. There is but little vitality, portion of the pulp has sloughed off, and little spongy growth which bleeds profusely. Has less apprehension with these cases than with No. 1. He devitalizes the pulp and fills the root. In Alveolar abscess prefers carbolic acid to creosote. He has met with few cases he could not control with any remedy. When there was yellowish discharge he had never succeeded in controlling.

Considers chances of success in strumous habits less liable than in bilious or sanguine temperaments Treatment is also modified by age, more difficult in young than in the old. The six year old molars up to fifteen years when the other teeth are good never devitalizes, but removes the tooth as the gap will close up.

Dr. Rambo, finds same difficulty, as Drs. M. and C. They are apparently easy, but when operated upon we have violent inflammation insuing. Sometimes thinks he forces air

... with gold avoiding forcing it
... fistulous opening and then fills
... nerve is not entirely devitalized,
... drinks producing pain, he des-
...y.

... If in the 1st case there is a dis-
... the trouble to treat depends upon
...

... if possible and removes the dead
... and wipes out the root with creo-
... few days with sadler's silk sat-
... removes and if it is impure he
... with cylinders. Thinks trouble
... root well. If the gold protrudes
... recommends in such cases Aconite
... internally and externally.

... said he had used the preparation
... great success.

... a, used floss silk saturated with
... fills crowns with gold.

... prepared roots by thoroughly treat-
... and until all soreness is gone, which
... then fills with cylinders wrapped
... than those used in crown fillings.
... introduces the cotton on a small piece
... is sufficiently large he obtains its
... Fills the root with plaster of
... syringe composed of a quill having
... one end and a fine nozzle on the
... creosote as before stated, force dry
... canal, the transparency of the quill
... how much plaster is introduced.
... in this way with a hard gray
...

... that such cases are only successful
... remedies the evil. He never fills
... performed her part, and believes

that filling the apex of the root is sufficient without filling the balance of the canal, and filling over an exposed pulp does not necessarily lead to its death. Cleans the canal with a pellet of cotton, wrapped on a broach, saturated with water and dipped in pumice. Uses gold to fill the canal. Objects to Os-artificial as it sets too rapidly.

Dr. H. Marshall said he always fills roots with gold. Never fills teeth directly after devitalizing the pulp, prefers treating eight or ten days, and thinks we only assist nature in such cases. Treats alveolar abscess with tannic acid, camphor and tincture of iodine, and in a week or ten days fills root with sponge gold dipping the first used in creosote.

Dr. L'Engle considers filling with wood impracticable in every case.

Dr. Holland described a case of three and a half years standing, he removed the filling and on passing up a broach found pus in the canal, he treated with diluted tincture of iodine for six weeks, then filled with gold, introducing it with the finest watchmaker's broach, winding a strip of gold around it, first dipping the end of the gold in creosote. Uses annealed and partial annealed broaches.

Dr. Redman had nothing new to offer, was not as successful as some others, wished to know how to get out of trouble when he is unsuccessful. In alveolar abscess he pierces to point of root and treats externally through alveolus, sometimes successfully and sometimes fails.

Dr. Ford. Fills roots with gold about two-thirds and then a layer of Hill's stopping and finishes with gold. Thinks interposing a non-conductor an advantage.

Dr. Carpenter fills with cylinders, believes cotton to be injurious.

Dr. Gorgas considers the use of a non-conducting substance an advantage. Uses Hill's stopping with os-artificial. The first at the apex and os-artificial on the Hill's stopping until he reaches the crown cavity, thus preventing the chloride of zinc from acting at apex of the root. Prefers using gold in in the form of small pieces torn from the sheet for filling

determines the length of root and introduces the gold as far as it can If the canal is large prefers gold ps, folding one over the other as he alveolar abscess feels we have much used carbolic acid, iodine and gly- d a case about one year since, supe- ulous opening extending from apex l bicuspid. Injection passed through eighteen months standing, drilled ot on the labial surface, and the fistu- e discharge continued through the successfully with carbolic acid, and

with iodine, creosote and aconite, nature or the medicine effects a cure. made succcesfully the next morning, nd nature meets your efforts with a not succeed, a frown greets you and face. He always fills with gold. never fills a root.

ates using os-artificial in root filling, bristle, and to prevent it setting too s it on ice.

s it important to fill roots to the apex. oaches as they may pass through the

sed an instrument for the removal of ulous opening, made from a piece of

d the chances of success depended temperament of the patient. Some eir tooth filled without removing the uffer the least inconvenience, while d every attention and care that inge- ommand, yet trouble would ensue in after the operation was completed, he

had been using for several years past in treatment of alveolar abscess, the tincture of hydrastis canadensis and found it much more effective in relieving and curing than any other remedy yet known.

The discussion being ended the meeting adjourned until 9 o'clock the following morning.

MORNING SESSION, FRIDAY 30TH.

The meeting was called to order at 9 A.M. by Dr. W. T. Arrington, the President, in the chair.

On motion of Dr. Jordan the reading of the minutes of the previous meetings was dispensed with. On motion of Dr. Carpenter the subject of exposed pulps was introduced for discussion.

Dr. Clark having the floor, stated that his treatment of exposed pulps was very simple, if he wished to destroy the pulp he made an arsenious application on a small plegget of cotton, then to avoid pressure placed a second and larger piece over that, leaving it in form 12 to 24 hours, then if he could remove the nerve and no unfavorable symptoms were present, he filled at once, but if there were any unkind symptoms, such as profuse bleeding or irritability, he delayed filling until by proper treatment all such symptoms disappeared. In simple exposure of the pulp there is no inflammation. He never attempts to remove until he has failed to save by inducing ossific deposit. This is a subject to which he has lately given much attention, and one which he thinks worthy of much more. He recited one or two cases to prove that ossific deposit is no longer a matter of doubt, but a fact.

Dr. Friedrich always treated to preserve pulp if possible and considers it our first duty. If it is healthy it requires no treatment. If there is hæmorrhage he arrests it by cauterising pulp with nitrate of silver, and thus forms a thin cuticle or skin to protect it. Does not consider the tooth is decomposed in the least by a slight application of nitrate of silver. Caps the nerve with some non-conducting substance and fills the tooth immediately.

Dr. B. F. Arrington caps nerve with asbestos wrapped in

[illegible] s been very successful for the last six or
[illegible]

[illegible] ned a case he had several years ago.
[illegible] or, large cavity and large exposure of
[illegible] anxious to save pulp. He caped it
[illegible] strong enough to sustain pressure of a
[illegible] used os-artitificial subsequently with
[illegible] e vulcanite base. Considers preserving
[illegible] ortance, would attempt it if there was
[illegible] of saving it, and the patient was suffi-
[illegible] ppreciate it.

[illegible] s nothing more desirable than to pre-
[illegible] e pulp. In the last two or three years
[illegible] aken place in the treatment of pulps
[illegible] perators, but does not think sufficient
[illegible] dge well. He has had but limited expe-
[illegible] s, has followed Dr. Atkinson's method
[illegible] with creosote and capping with os-arti-
[illegible] uccessful. In some instances great pain
[illegible] cial, requiring removal in a few minutes
[illegible] creosote, and returning the application
[illegible] otton saturated with gum sandarac,
[illegible] ced more by the pressure than by the
[illegible]

[illegible] had met with so little success in pre
[illegible] f pulps that he does not undertake it
[illegible] To devitalize, uses arsenic, ac-morphia,
[illegible] e, protects application by lead cap, it
[illegible] Had used collodion and sandarac.

[illegible] en in the habit for the last twenty years
[illegible] emoving the pulp. He had tried all
[illegible] e had better success with tin than with
[illegible] -artificial to them all. Had little con-
[illegible] p, where there is exposure and bleeding.
[illegible] senic and creosote, sometimes uses arse-
[illegible] inks it is the proper mode of using it.
[illegible] l in capping with os-artificial. If there

is an excess of fluid it will produce pain, the cause of the pain is the chloride of zinc. Tooth is sometimes red from broken up red globules and the coloring matter of the blood being injected into it.

Dr. Gorgas used creosote and ac-morphia to destroy pulp. Creosote is the vehicle; has used water with success. Does not believe in using caps over nerves. Has been successful with os-artificial, applies it on old or soft linen and fills the crown cavity with the os-artificial and allows it to wear away and then fills with gold.

On motion of Dr. B. F. Arrington the regular order of business was suspended to hear a paper read by Dr. Crowe as follows:

"A gentleman in fine health about thirty years of age applied to me about a year ago for treatment. Upon examination I found the right superior lateral incisor moved forward from its natural position from the habit of holding the pipe under it in smoking. It was easily moved in its socket, and there appeared to be a wasting of the gum around it, the root being somewhat exposed. There was also a yellow deposit in a slight degree, of a soft matter somewhat offensive in odor. The patient was exceedingly cleanly in habit, and his teeth remarkably free from decay. My treatment was first to move the tooth to its original position with a rubber band. The patient then gave up smoking and used an antacid mouth wash. Three weeks after there was no improvement whatever.

The treatment was then changed to the use of acids and careful regulation of the diet. Still no improvement. Some months after, during my absence, the tooth was extracted by a brother dentist, and on my return was brought to me for inspection. It was perfectly sound, the fang, however, I found to be covered on one side by a dark brown incrustation having every appearance of salivary calculus. It appeared to be uniform in thickness throughout its whole length, and extended to within about three lines of the apex of the fang. Would it have been advisable after the extrac-

... discovery of the deposit thereon ... in its original position?

... a bad case of salivary calculus. ... were affected. An old gentleman ... salivary calculus on their teeth, treat... removing the gum up to apex of ... calculus, there was not so much ... other forms of disease, there was a ... always in such cases removed the ... of the periosteum, and treated ... both an astringent and stimulant. ... ago where he could run the instru... the root, he removed the pocket and ... apex. Knew that Dr. Robinson, ... Nashville, transplanted successfully ... family.

... deposited under the gum irritated ..., he always removed it with instru... recommended astringent mouth washes ...

... not think tartar existed on the root ... Dr. Crowe. There could be no ... was no tartar; he could not say what ...

... had seen cases of absorption without ... to teeth that hold the pipe or ... thinks nicotine may be the cause. ... crystaline formations were tartar. ... said he had seen cases where it was ... of the periosteum from nicotine. ... F. Arrington, the Code of Ethics ... of the various members of the Association.

... was tendered to the city, the press, ... Railroad Road companies, for favors ... extended to the Association. ... were unanimously passed.

Resolved. That this Association will not at this or at any future meeting as a body, take into consideration and report upon the merits or demerits of dental material, instruments or furniture of any description.

Resolved. That the Southern Dental Association hereby most respectfully tenders a vote of thanks to Mr. Samuel Hape of the Dental Depot, of Atlanta, Ga., for his successful efforts in making excellent arragement for their first meeting and for the many civilities extended to them during the session.

Dr. John G. Angell of New Orleans read a thesis upon the subject of Anæsthesia which was accepted and referred to the proper committee.

The following members were delegated to the American Dental Association.

Drs. Morgan, Gorgas, Walker, Clarke and Crowe.

The printing of the Code of Ethics was referred to the Publication Committee.

The subject of Green Stains was then introduced for discussion, and Dr. Rambo being called upon said that he observed these stains from infancy to puberty and thinks it is the effect of softening of the enamel by acids, caused by want of proper cleanliness, producing disintegration of the enamel. If there is no decay he removes it with pumice and soft wood, and polished with soap. It will return again unless the child takes great care of the teeth. He does not like to remove it with instruments.

Dr. Clark had observed these stains with sensitiveness of the teeth, and gum receeding from the enamel. He removes the stains in a similar way to Dr. Rambo, and treats the sensitiveness with one or two applicatious of the nitrate of silver. If it discolors the tooth it can be restored by applying salts or chlorine.

Dr. B. F. Arrington said he had been using nitrate of silver twelve or fifteen years with success. He envelopes the caustic with wax and trims it according to the surface he wishes to apply it. If to be applied to the neck of the tooth, he wipes the gums dry and covers with a film of collodion. The discussion was then closed. Mr. Sam'l Hape

d to each member of the Associa-
of the paper containing an official
gs of the meeting of the Associa-
l to the Treasurer Dr. Redman.
ittee was instructed, by vote of the
cane, with gold head and proper
ted to Mr. Samuel Hape at the next
d in New Orleans.
lled upon for the closing remarks,
come to the meeting. He had left
itself, but felt he was amply repaid
ed we would all meet face to face
il. All the other members coincided
McAuley, and with good spirit and
sociation adjourned to meet the sec-
next at New Orleans, La.

RTICLE IV.

an Dental Association.

RNE, D.D.S., New York.

ting of the American Dental Asso-
toga Springs, New York, commenc-
3, 1869. There was an attendance
ty-six members.
called to order at 11 o'clock by the
Taft, and the session opened with
Woodbridge, D.D.
New York, Chairman of the Com-
delivered the usual address of wel-
ved by the roll-call.
mmittee on Dental Pathology and
nd read by Dr. Atkinson.
ss were then appointed, and an
o'clock. The whole of the after-
ied with discussions upon Dental

SECOND DAY.

The Treasurer presented his report, which was referred to an auditing committee; and the discussion on Dental Pathology and Surgery was resumed.

The Committee on Dental Chemistry failing to report, Dr. T. L. Buckingham made, by request, a verbal report.

The rules were now suspended to allow Professor Trueman to offer two resolutions: one directing the Treasurer to refund certain dues claimed to have been illegally demanded; and the other recommending dental societies to admit female practitioners to membership. The resolutions were temporarily laid on the table.

The discussion of Dental Chemistry ensued; after which the time of final adjournment was fixed at 5 o'clock of Friday.

At the opening of the afternoon session Dr. C. R. Butler presented the report of the Committee on Operative Dentistry. The rules were then suspended, and the following Nominating Committee was appointed, and instructed, for the present, to nominate the standing committees only.

W. W. Allport, C. Francis, M. S. Dean, T. L. Buckingham, Homer Judd, L. D. Shepard, A. H. Brockway, A. L. Northrop, C. W. Robinson.

The regular order being resumed, Dr. C. Palmer made an additional report on Operative Dentistry, illustrated by large diagrams and models of the superior and inferior dental arches; and Dr. Perkins presented a patient who had lost the entire inferior maxilla from phosphor-necrosis.

The Auditing Committee, consisting of Drs. M. S. Dean, E. A. Bogue, and L. D. Shepard, to whom the Treasurer's account was referred, reported it to be correct. They expressed the opinion that the permanent members consist of all those who have once attended as delegates, and that such persons remain permanent members until, their dues being paid in full they voluntarily withdraw, or are dishonorably dropped from the rolls for non-payment of dues. They also recommended the adoption of the following resolutions:

[illegible] dentist having once appeared as a dele[illegible] permanent member, is not eligible to act [illegible] until his dues are paid in full.

[illegible] te this resolution, on a call of the yeas [illegible] d by a vote of 29 to 28 ; the President [illegible] tive.

[illegible]. Horne changed his vote to the affirma[illegible] e moved a reconsideration, which was [illegible]

THIRD DAY.

[illegible] sented the report of the Publication [illegible] owed a balance of $152.78 to be due [illegible] ee published five hundred copies of the [illegible] 8, at a cost of $475. The report was [illegible] mmittee discharged, with the thanks of [illegible] the balance due ordered paid.

[illegible] Committee reported the names of Stand[illegible] the ensuing year. The report was [illegible] nstructions to make certain changes, and [illegible]

[illegible] red a resolution to refer to the Commit[illegible] ature a new work of Dr. J. E. Garretson, [illegible] nd Surgery of the Mouth," which he [illegible] ghly, as the last and most accurate state[illegible] n of medical knowledge in this depart[illegible] tee declined to consider the subject, from [illegible] e resolution was laid on the table.

[illegible] n Prize Essays made the usual report, [illegible] en presented for their consideration.

[illegible] Operative Dentistry was then commenc[illegible] rest of the morning session.

A[illegible] ement of the afternoon session, after [illegible] City of Nashville was selected as the [illegible] g.

[illegible] he wanted every member of the Associ[illegible] was bound to be present at the next [illegible] le. He related of Professor Agassiz,

that on being requested to visit various cities to lecture, he replied that he had not time to be running about making money, he had more important business to attend to. He (Dr. M.) desired members to feel that it was of more importance to them to attend the annual meetings than to stay at home and make money.

Dr. Atkinson said he had been requested by Dr. Evans, of Paris, to say that he had expected to be present at this meeting (having been mistaken as to the date of its session), but that he had to return to Paris to be present on the fete day of his pet emperor. He had been greatly pleased with what he saw of Dr. Evans, during his short stay; he was one of the few men who could be petted without being spoiled; he had received without solicitation, many orders of knighthood; and he (Dr. A.) indorsed him as a Christian and scholar, Though dwelling so long in a foreign land, he had maintained his loyalty to American principles and American dentistry, and he desired to be so recognized by his fellows in this Association.

The Committee on Nominations then made the following report:

FOR OFFICERS.

President.—Homer Judd, St. Louis; W. W. Allport, Chicago.

First Vice-President.—S.J. Cobb,Nashville; J.F. Knapp, New Orleans.

Second Vice-President.—C.E.Francis, New York; W.H. Shadoan, Louisville.

Corresponding Secretary—I. A. Salmon, Boston; H. J. Smith, Illinois.

Recording Secretary.—W. C. Horne, New York; M. S. Dean, Chicago.

Treasurer.—W. H. Godard, Louisville.

STANDING COMMITTEES.

Committee of Arrangements.—W. H. Morgan, S. J. Cobb, W. H. Shadoan,

... *ion.*—M. S. Dean, E. A. Bogue,

... *ays.*—G. T. Moffatt, J.F. Adams,
... nings.

... *ysiology.*—J. H. McQuillan, Jas.

... *Chemistry.*—T. L. Buckingham,

... *athology and Surgery.*—W. H.
... R. Butler.

... *Dentistry.*—J. Taft, George H.

... *cal Dentistry.*—W. H. Eames,
... M. Sturgis.

... *iterature.*—L. D. Shepard, J. Mc

... *Essays.*—I. J. Wetherbee, C. D.

... *Histology.*—Homer Judd, W. W.

... *Therapeutics.*—T. B. Hitchcock,
... s.

... *Instruments and Appliances.*—
... nes, J. B. Morrison.

... ees were confirmed. An evening
... to receive the report of the Com-
... the Constitution.

... session was opened, and the above
... epted. After various motions to
... he whole subject was laid on the

... as then held.
... Allport were voted for, and, after
... er Judd was elected President;
... C. E. Francis, Vice-Presidents;
... ling Secretary; Dr. M. S. Dean,
... W. H. Goddard, Treasurer.

The Association then adjourned to the next morning.

FOURTH DAY.

A committee of five was ordered to make arrangements for reduction of railway fares to Nashville next year, namely T. L. Buckingham, I. J. Wetherbee, E. A. Bogue, G. H. Cushing, G. R. Thomas.

Dr. McQuillen, Chairman of the Committee on Histology, made a verbal report, accompanied by a number of microscopical specimens recently prepared by him. 1, of injected pulps of calves' teeth; 2, of the kidney of the sheep; 3, of the muscles of three persons who had died within the past year of trichiniasis, along with a portion of the pork, containing trichinæ, which had caused the disease of one of the deceased; after which the subject was discussed.

The report from the Committee on Mechanical Dentistry was presented by Dr. John Allen, who regretted that, while the operative branch of dentistry had advanced so much within a few years, in this department, the general course of dentists, had been to make the cheapest instead of the best work. The difficulty of obviating the discrepancy between the mouth and the dies made from the impression was admitted, but the idea of remedying this by resorting to a plate of lighter material was controverted as false in principle, which was exemplified by the simple experiment of a sheet of paper supported upon the mouth of an inverted tumbler full of water. There is demand, then, for a process, which shall insure mathematical accuracy in the fitting of the plate; as well as great need of skill in the arrangement of teeth to conform with the characteristics of the face.

He was followed by Dr. S. B. Palmer of Syracuse, with an essay on "Repairing Vulcanite," and by Dr. J. A. Mc Clelland with an essay on the "Collodion Base."

The essay of Dr. Palmer is explanatory of a method of thoroughly repairing broken rubber-plates by varnishing the surfaces, to which the new rubber is to be attached, with a creamy solution of rubber in chloroform; to be kept on

[illegible] He states that repairs made in this way
[illegible], even if the broken edges are only bev-
[illegible]iling or perforating the old piece. Wax,
[illegible] soap are agents which prevent rubber
[illegible]ed, and they should therefore, be care-
[illegible]act with any piece to which it is intend-
[illegible]ess.

[illegible] Consolidated Collodion, Pyroxylin, or
[illegible]thusiastic description of the method of
[illegible]rial for use in dental plates. It is pro-
[illegible]zed as "the coming base." The time
[illegible]poration of the ether seems to be an
[illegible]ause we have become so demoralized in
[illegible] the use of a cheap substance (rubber)
[illegible] few hours and little skill to make into
[illegible]ice the time required for 'Rose Pearl, to
[illegible] mouth is soon regarded as gain rather
[illegible]rinkage of the material is said to be con-
[illegible]ple means that the cry, "It shrinks!"
[illegible]iculous insignificance to the friends of
[illegible]

[illegible]mer exhibited an improved moulding
[illegible] its advantages in difficult cases. A vote
[illegible]mer was passed (which the Secretary was
[illegible]andsomely engrossed) for the manner in
[illegible]nted, by means of plaster models and dia-
[illegible] method of preparing and filling teeth,
[illegible] classification of fissures where teeth are
[illegible].

[illegible] Committee on Voluntary Essays was
[illegible]ted.

[illegible]from the Committee on Dental Educa-
[illegible]port on the importance of a thorough
[illegible]on for dental students, and was followed
[illegible], with an essay on "Dental Education
[illegible]

[illegible]ated the diffusion of knowledge in regard

to the preservation of the dental organs by means of tracts or periodicals. He believed there was great necessity for for such information, and that it would be highly appreciated.

Dr. Cobb indorsed the sentiment of the essayist; he was greatly impressed with the ignorance of educated people in regard to their teeth; all that the community know in regard to such matters is the little they pick up in the dentists' offices. He held it to be the duty of practitioners to instruct their patients. Many more people would have their teeth preserved if they knew that it was true economy to do so. He strongly commended the plan of the *People's Dental Journal*, and was much in favor of the distribution of tracts to increase popular dental knowledge. There would be vastly more dental work done if the people knew the importance of it; something in the form of a catechism, or instructions which might be introduced into schools, was a *desideratum.* No branch of knowledge was more neglected, and none would insure more immediate good results by its propogation. It was a common idea that the charges of dentists were exorbitant, whereas they were far more moderate in proportion than those of physicians and general surgeons.

Dr. McDonald advocated the preparation of tracts, under the auspices of the Association, for distribution among the people. Early instruction in regard to the value of the teeth, and proper means of caring for them, would be of immense value to the American people and to American dentists. A great many more teeth would be filled, but there would eventually be a great many less large operations to be performed, and, consequently, a great deal better condition of the teeth might be insured at much less expenditure of money.

The Committee on Dental Literature had no report.

The Committee on Dental Therapeutics made a very brief report by Dr. Bogue.

The report of the Commmittee on Dental Instruments and Appliances was presented Drs. F. Abbott and C. Palmer. They noticed improvements in dental chairs by J. B. Mor-

[illegible]te; a plating for instruments of pure [illegible]nson; an imstrument for rolling gold [illegible] of Worcester; an instrument for reg- [illegible] manufacture of nitrous oxide, where [illegible] is used, by J. P. Collidge, of Boston; [illegible] close the duct of Steno, by B. T. [illegible] mallet by W. H. Jackson, of Ann [illegible] regulator and heater where kerosene [illegible]rous oxide, by A. W. Sprague; burs by [illegible] steel regularly divided and evenly cut, [illegible]g left with the file finish as in ordinary [illegible]ing, finished with a stone to an edge [illegible]e, so that in the hands of a sufficiently [illegible] will cut with the least possible pres- [illegible] entirely the unpleasant sensation of [illegible]cial teeth, by S. S. White, which the [illegible]re the finest they had seen, in their ex- [illegible]ion between the upper and lower sets; [illegible]and chloroform inhalers, by Dr. Wil- [illegible] safety in the use of these inhalers by [illegible]rol of the supply of atmospheric air, [illegible]rtions.

[illegible] Executive Committee was then pre- [illegible]

[illegible] Committee on Amendments to the Con- [illegible] from the table, and the report was [illegible] a reading of it.

[illegible]ution on the right of female dentists to [illegible]efinitely postponed, because the Associ- [illegible]make recommendations to local societies.

[illegible] gave notice of an amendment to the [illegible]cted upon next year, providing that no [illegible]ental patent, or is pecuniarily interested [illegible]ember of the Association.

[illegible]an offered a resolution donating the [illegible]s, from 1865, to 1869, to thirty-three [illegible]reported by him to be arrears, each to

the amount of $23. The resolution passed after an animated debate.

The Committee on Ethics reported, through Dr. Shepard, that they had had brought before them charges against Dr. J. A. McClelland, of Louisville, for violating Article II., Section 3, of the Code of Ethics, by placarding large advertisements on the street cars of Louisville, and by unprofessional advertisements in the papers, which were read; they therefore offered the following resolution: "That J. A. McClelland, of Louisville, be expelled from this Association."

They also reported that they found upon the records of the Association charges against Dr. C. P. Fitch, of New York, for violation of the same clause of the Code of Ethics; but they did not feel authorized to recommend action on his case, as no definite charges or proofs had been offered.

Dr. Atkinson called to mind the remark of Dr. McQuillen at the time of the adoption of the Code of Ethics, that it was unnecessary for gentlemen, and useless for those who were not such. He did not like the idea of singling out one or two as examples and leaving all the others to go free. It was well known that Dr. Watt, who had so persistently urged the adoption of this code, had gone home and signally violated its provisions, and yet no one had lifted up a voice against him. He thought the adoption of laws of this nature peculiarly unfortunate; because they would be brought to bear unequally; while one would be made to suffer the utmost penalty, others wonld be allowed to go free.

Dr. Fitch asked to be heard in explanation. He said that many loose and unfounded charges were floating about against him. The sum of his offence, he said, was this: that he had advertised the public of New York in good faith that he was ready to operate at reduced prices on certain days and hours; because there was a large class of most worthy people in that city who were desirous to preserve their teeth, and could not afford to pay the current rates of first-class operators. He had done nothing to lower the standard of professional skill, but only made use of the cir-

...ase to minister to his necessities. He
... his love for the profession, and his de-
...ent. He had meant to do no wrong in
...ursued, and, whatever the action of the
...ndeavor to maintain the character of
...ations, and devote his efforts to the re-
...hin the range of his practice.
... made to refer Dr. McClelland's case to
...thics for the ensuing year—
...posed very strongly the postponement,
... proceeding at once with the trial of this
...ost flagrant one. As already stated, he
...doption of a code of Ethics; but since
...of the organic law of the Association,
...rcement. While it was mortifying to
... had been violated by one who had pre-
...ost zealous in forcing it upon the organ-
...not an unusual thing in the history of
...ake laws and then to be the first to break
...h better to make few if any professions,
...han fall short of such as are made. We
... deal with cases in which specific and
...tiated charges had been brought before
...o such were under consideration. One
... had abandoned the objectionable prac-
... explanation with the desire of making
...ut in the other instance the accused was
...most objectionable manner possible, pur-
...onal course. The rules of the Associa-
...en suspended that there could be no pos-
...oing so then, and proceeding with the
...charged with the offense was present, and
...be done to him, as the members would
...hat he might say in defense of his course
... upon it. If there was one class of men
...om he entertained the most profound
...would not say contempt, for one should

endeavor to unlearn that) it was those who were so lost to all sense of propriety and decency that they could stoop to the low tricks of charlatans, and thus engage in practices which cast stigma upon themselves and the profession they dishonor. If such as these were to be present as meet companions, it would soon make not only the Association but the profession a by-word and a reproach. What they could want in the organization was difficult to conceive, for they were not with it in spirit, and should not be of it in person. Laws promptly and justly enforced in such a case would exercise a beneficial influence upon the *morale* of the profession.

Dr. Horne stated that the clause under which Dr. McClelland was indicted required that the charges should be investigated and reported upon at the next annual meeting after that at which they were made. The Association had adopted the report of a committee which proposed to substitute a new Constitution without a word of debate. If the old Constitution were in force, Dr. McClelland had the right to a copy of all the charges and specifications, and a year to answer in; if the new one were in force, there was no provision by which he could be brought to trial.

The portion of the report in regard to Dr. Fitch was then adopted; that relating to Dr. McClelland was referred to the Committee on Ethics for the ensuing year. Drs. W. H. Morgan, C. R. Cutler., and L. D. Shepard were appointed as that committee.

A resolution of Dr. Bogue's, expressing regrets at the existence of misapprehension as to certain members (unnamed), and for the injustice of an *ex post facto* interpretation of laws, was laid on the table; and another, by the same, calling for a vote of censure on Dr. Atkinson, for disregarding the rules of order, was replied to by Dr. Atkinson in a characteristic manner. The resolution was ordered to be expunged.

The Publication Committee was instructed to print the Constitution with the Transactions.

s then inducted as President, and Dr.
fter which the Association adjourned
August, 1870.

L DEPARTMENT.

he Southern Dental Association.—It is
o little pride that we are able to inform
t meeting of this new Association, or-
Southern Dentists, which was held at
the last week of July, was all that its
ve desired.
ny assemblies of this character, but re-
e such universal satisfaction to those
eeting of the Southern Dental Associa-
its future usefulness.
and pleasure experienced, that all who
respective homes feeling satisfied that
ade in leaving their professional duties
We also refer with pride to the fact that
was spoken in the debates upon organi-
, &c., to interrupt the harmony of the
y feeling prevailing altogether free from
to professional organizations. There
art of every member present a willing-
rds advancing the interests of the pro-
of self aggrandizement.
the Association on the manner in which
presided over, and the ability for con-
was shown by all the officers appointed
The character of the members present
any Association, and the universal good
together with the interest manifested in
he highest degree encouraging for the
rmanence of this organization.
at the organization of this Association
atulation, as no other Dental Association
with even half the number who partici-
ting. The Association was also happy
as the place of its first meeting, for more
er been extended to any professional
ich its members experienced from the
g Southern City. The City Council of
use of the City Hall, provided a sump-
bers of the Association at the National
appreciated—it was such a repast as

fully established the reputation of the proprietor of this first class house. A number of ladies graced the table with their presence, and several members of the City Council and the Medical Faculty of Atlanta. Among the guests present we were pleased to meet Prof. J. P. Logan, late of the Washington University of Medicine, Baltimore, but now practicing in Atlanta. The rail-road companies also extended courtesies and aid, which were duly appreciated. To Mr. Saml. Hape the proprietor of the Dental Depot, and to the members of the dental profession residing in Atlanta, the Association is under many obligations for the kindness and courtesies extended, and their labors to render the meeting in every way a pleasant one.

The good effects of this Atlanta meeting were shown by the organization of several State societies in States where no such action had before been taken. These State societies were organized immediately after the adjournment of the Association by prominent members in attendance; and this action clearly proves the justness of the statement we made when advocating the formation of the "Southern Dental Association" in the Journal, namely—that it would exercise such an influence for good as no one of the already existing Associations could accomplish.

Drs. Morgan and Clarke.—In the editorial matter of the May No. of the *Journal* was published a selected article, from the *Dental Register*, written by Dr. W. H. Morgan, which contained a serious charge against Dr. F. Y. Clarke. This article referred to the action of Am. Dent. Association towards Southern Dentists, and accused Dr. Clarke of having in his possession at the Boston meeting, a secret service medal, obtained from Gen. Wilson, U. S. A., and exhibiting the same to certain members of the Association.

We are much gratified to be able to inform our readers, that at an interview which occurred between these gentlemen at the Atlanta meeting of the Southern Dental Association, the charge against Dr. Clarke was withdrawn by Dr. Morgan, the latter feeling that injustice had been unintentionally done the former.

From what occurred at the Boston meeting, Dr. Morgan felt that he was justified in making this charge, but as Dr. Clarke satisfied him that the medal in question was one of a totally different character, and that the remarks concerning it were uttered in jest, Dr. M. is now satisfied that injustice was unintentionally done Dr. Clarke.

In justice to both parties we make our readers acquainted with the true facts of the case by this explanation of the causes which led to the misunderstanding.

...orial Department.

...Court Dentist to the Emperor of France, ...aid a short visit to this country in July ...greeable visit from the Doctor during his ...m to be, what we have ever regarded ...ntleman; and one much more youthful ...had imagined, his name having been fa... ...for so long a time.

...r *No. of the Journal.*—This number has ...e usual time of issue in order that we ...t our readers with a full and complete ...ngs of the first meeting of the "Southern ... Had we gone to press earlier we should ... publish a mere outline of the proceed... ...red in the Sept. Nos. of other Journals. ...h is such an interesting one, that we feel ... will pardon the delay.

...ans' article on "Pivot Teeth," published ...he *Journal*, on page 157, line 7, instead ...*cup*. Absence from home prevented our ...s of this article, otherwise such an error ...d.

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DENTAL SCIENCE.

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ARTICLE I.

Hints on Vulcanite Work.

By James B. Hodgkin, D.D.S., Alexandria, Va.

The attention of the writer was called last winter to the improvements of Messrs. Stuck & Owens in vulcanite work, and being favorably impressed with its merits, a trial of it led to some experiments in varying the manipulations of the polished tin sheets used in that method, and also the block tin models, the results of which experiments are thought of sufficient importance to merit publication, as possessing advantages over the method of the above named gentlemen as set forth by them.

The advantages of the block-tin model are claimed to be "shrinkage," whereby a closer fit is obtained than can be by the ordinary plaster model. But the close observer will find so many vulcanite plates made on plaster models which give perfect satisfaction, as to doubt if the advantage of shrinkage is so great as is claimed in the main, however desirable it may be in certain exceptional cases. Allowing, however, that it is desirable to obtain a shrunken model, (as it unquestionably is occasionally) it is doubtful if the plates made after the directions of the patentees are as close-fitting as is claimed. Let any one carefully measurethe shrinkage of a tin model, and it will be found that it is about compen

... "chemically pure tin" which is bur... ...at model. It is doubtful if a plate made ...thus prepared is any smaller than one ...of fine plaster.

...e said in passing, little or no advantage ... plates as thin as those exhibited by the ...wever, each operator can control for him... ...ertainly no better for being highly pol... ...surface, but the contrary.

...ted by the writer, after a careful trial of ...ed by the gentlemen holding the above ...s as follows: Take an impression in sand ...n about equal proportions, using any ...hasten the setting, a solution of half an ...f Potash in a quart of water will answer ...n ordinary impression cup is used, which ...shed. When the impression is fully set, ...er, and it will, with a little manipula... ...cup. Tapping gently on the handle of ...disengage it. This impression must be ...advantages of taking it thus are that ... of melting cups, and consequently it ...r from the anxious watching of the dry... ...iates the necessity of sawing openings ... impression for the escape of steam to ... The method of Messrs. S. & O. in... ...across the back of the impression with ...he melted metal. This is a waste of ...utty answers a better purpose. In ex... ...matter, the writer in following out the ...ese gentlemen, melted several cups from ...the temperature and in drying out the ...r plan, which is done in the cup. The ...mpression (the ordinary plaster one with ...s per directions of Messrs S. & O.) out of ...g it was tried, but it was found that ...r across the back part of the impression

caused it to warp appreciably by its expansion in setting, and the plates made on these models rocked so that the impression of sand and plaster with putty surrounding it was found to be, in my hands at least, the best.

The model thus obtained is the one on which to vulcanize. No covering of sheet tin is wanted, and a decided shrinkage is obtained, but not too much when close adaptation is desired. The brilliant polish characteristic of the method under discussion, and which is so taking to the eye of the novice, is not obtained in so high a degree it is true, but for mouths where shrinkage is really needed a plate made directly on this model as above described, will be found to possess decided advantages over its more lustrous competitor. The model will come from the impression, if the latter is thoroughly dried, smooth and undefaced, and without the unseemly burs made by the saw-cuts in the impression, which are with difficulty effaced, and are usually covered by a vacuum cavity of huge dimensions.

Within the past few months I have placed in the mouths of patients a number of plates made after the manner above described, which are being worn with great and increasing satisfaction.

Many of these persons had spent much time and patience in vain endeavors to wear plates made after almost every other plan, both of metal and rubber; and all agree in pronouncing the present dentures much superior to anything heretofore worn. I may add that for several of them I had previously constructed rubber plates on several different methods, "Stuck & Owens" included, without success.

This much for a process, which I am of opinion, does not impinge the rights of the patentees mentioned above, and which I modestly think superior to theirs, and I may add if not an infringement, will not be patented, at least by myself.

I now proceed to notice what is considered to be an important modification of this process of using tin linings to the plaster models for forming rubber plates, a process quite

[illegible] g connected with the subject. To get [illegible] rface to the plate where the ordinary [illegible] —in other words to be rid of nearly all [illegible] up rubber plates in either partial or [illegible] ing method is adopted:

[illegible] h in the usual method, and make the [illegible] m over this a loose plate of sheet gutta [illegible] vill not answer as well. Make this [illegible] ulcanite plate is desired to be. Mount [illegible] ual way. Insert the cast and teeth in [illegible] e flask, bringing the plaster over the [illegible] y practiced. When this has set, slightly [illegible] of the base plate, and fill over with [illegible] ds take a plaster impression of the ex- [illegible] base-plate. When this has set, remove [illegible] on it a piece of the pure sheet tin; [illegible] l not reach quite to the teeth, it should, [illegible] to the posterior edge of the plate. Place [illegible] and adjust it nicely into position, using [illegible] ssary. It will not quite reach the teeth, [illegible] he surplus rubber to pass out. When it [illegible] put on the upper half of the flask and [illegible] he usual precautions to ensure separa- [illegible] e escape of surplus rubber, as described [illegible] bber as usual, but before doing so polish [illegible] nd thoroughly, being careful not to leave [illegible] specially taking pains that all traces of [illegible] d being careful to keep the rubber scrup- [illegible] has been well done and the flask en- [illegible] be found after vulcanizing not more [illegible] n inch around the edge of the plate will [illegible] r, and the labor of hours will have been [illegible] nutes. Soft, half worn cotton cloth is [illegible] plate.

[illegible] ation of this process, and this already [illegible] be concluded. It applies to entire upper [illegible] vith rubber above the teeth. The intel-

ligent reader will perceive that the description just given applies to those cases where the teeth rest on the natural gums, or where there is rubber above the teeth: Let the teeth be mounted after any method preferred as to the sort of model used, either plaster or metal will answer. When the case is waxed up ready for investment, set the plate on the model and run a plaster cast over the lingual suface of the plate, getting also an accurate impression of the teeth. Put also a temporary investment about the outside of the teeth and plate above them, when this last has set pass a thin instrument through it at the median line, so that it may be taken off in two pieces without breaking it; when all is set firmly, remove the cast from the lingual surface, but do not disturb the outer investment. Burnish down on this impression the tin polishing plates as previously described, and fit it neatly and accurately to the plate and teeth, using a burnisher for this purpose; the outer investment will prevent the teeth being displaced. Now remove the temporary investment from the outside, it will come off in two pieces, separating where the division was made at the median line, and to each piece adapt a strip of the tin with fingers and burnisher; let them be slightly longer at the front than the cast on which it is moulded that they may lap a little. Adjust these strips neatly and closely to the necks of the teeth and to the base plate above them, seeing that they do not come much above where the rubber is to be. Insert this in the usual way, using the precautions to ensure cleanliness mentioned above, being careful to close the flask slowly and entirely. The product will be, in intelligent hands, a plate almost completely finished, a little trimming perhaps where the edges of the tin plate touch the teeth, and the removal of the waste rubber and finishing up the edge being all that remains to be done.

With regard to the vents for the escape of the surplus rubber, it may be mentioned that they are better if made by the removal of a small part of the entire surface of the plaster, instead of cutting grooves as is commonly done; cutting

e with a knife; commencing shallow pening as the edge of the flask is ap- r vent to the surplus material and is respects. But do not make the mis- ent too wide next the teeth; in it rub- e it is slowly pressed into the desired

bove shall on trial, prove as satisfac- practice as to myself, I shall consider r the writing of it in the "dog days" her cares upon me, and no time for re-

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ARTICLE II.

Maxilla and its Changes.

OHN R. BARR, D.D.S.

variations of this bone develop some le phenomena, that occur in the human formative process. No other bone, the pted, undergoes so many changes.

ions which the lower jaw is found actu- e result of accident or disease, to both from its prominent and isolated condi- its functions. The loss of the teeth o be the exciting cause of many of these nd unbroken condition of the economy, in the jaw until old age, and we see no king place except the slight approxima- n results from the gradual wearing away eeth by the mechanical act of mastica- we rarely ever meet with such a condi- d one jaw in old age still glistening with d fifty almost entirely devoid of them, blackened stumps—here and there—to er usefulness. Disease being the gen- ealth its exception, many of the varia-

tions of this bone are to be regarded as pathological effects. We shall consider the teeth in their immediate relations to the lower maxilla, and the effects consequent upon their removal. During the first development and growth of the inferior maxillary bone, changes take place in its form and structure which have an important bearing upon the future existence of it, as a necessary and peculiar bone. When we see the first feint outlines of the jaw, these too are the first indications of dental development manifested, and these, upon the authority of Mr. Goodsir, can be seen as early as the fifth or sixth week of inter-uterine existence, when the human embryo is but an inch in length. Upon inspecting the cavity which we would scarcely at this early period call a mouth, we will see preparations for the dental organs in the primitive dental groove, which makes its appearance about this time, and from it the first stage of dental formation takes place. If, at the seventh week of inter-uterine existence, we again inspect the cavity, we will find on each side of the arch and at the bottom of the groove a single projection of mucous membrane; and this increases and after a short time becomes a papilla, which is the first and rudimentary form of the pulp of the tooth. In a few more weeks the papillæ of the temporary teeth are inclosed within the jaw, by the approach and closure of the lips of the primitive dental groove, in which we find them first formed. Coincident with the closing of the lips of the primitive dental groove, the provident maxilla opens another groove behind the first, in which are to be developed the permanent teeth. After the lapse of a few more weeks these in turn are shut in, and take their position behind the deciduous teeth. In this position their development is perfected, and and from this situation they grow and make their appearance through the gums, at a time when the child having grown and increased in vigor, stronger masticatory apparatus is required to triturate the more substantial food which the necessities of the system demand, as the child emerges from infancy to childhood, and from childhood to the full vigor

...e have the curious phenomena of one
...nother one, the jaw serving as a cover-
...formation of another and lower order
... As soon as the teeth are fully formed,
... makes its appearance loaded with
... of nature, which it has shielded from
...t once begins the arduous duties which
...o perform, in the active campaign of
... period, infancy, that the changes of
...t visible, and the mysterious result of
...ons that nature has been carrying on
...ory begin to show themselves. Just at
...rowing wants of the child demand it,
...emerge from the bony parietes of the
...oat of mucous membrane which covers
...eing heralded by pains which, like those
...nce the importance of those whom they
...ans have considerable to do just now
...n of the jaw, and this is shown by the
... of a deciduous tooth, when the alve-
...ct, or it will remain stationary at that
... bone remaining in its original position
...rease; this effect we readily conclude
... to the alveolar ridge. The jaw con-
...d width and length during and even
... the deciduous teeth. This may be
...by the separation of the temporary in-
...hich phenomena is noticeable about the
... And, somewhat later in life when the
...hildhood to the full bloom of manhood,
...oadening of the anterior portion of it
...e can easily show by the presence of the
...hind the position occupied by the decid-
...t the time of their eruption are found
...he coronoid processes, that there must
...e in the length of the lateral portions
...w. The bone must have grown at this

point between the coronoid processes and the temporary teeth. An increase of the body at the angles, as also an increase in the length of the rami, are likewise obvious and progressive. When the eruption of the permanent teeth has been completed, the rami are found to occupy nearly a vertical position with the plane of the bone, and were the teeth to remain in a normal condition, free from disease, and unaffected by the many accidents to which they are exposed, the jaw would be but little changed during adult life. The base of the jaw in the child is arched a little upwards, and backwards from the chin to the angle on either side, and this makes the bone at the base of the coronoid processes a little narrower than at any other point. In the adult this bone is of nearly the same breadth along its entire lateral length, as anatomists tell us, and in the aged person it becomes again arched, returning to almost its original direction after all the teeth are lost. Omitting those pathological changes of the bone in question, which are the result of irregularity of the teeth, we come to those changes which are brought about by the loss of the dental organs. The molar teeth from their large size and position in the arch, are the cause of many of the deformities of the jaw, they are generally the first to be attacked by disease, and, as a consequence, the first to fall a prey to the forceps. The bicuspids are the next upon which the leaden hand of decay is laid, and when we have the loss of both these classes of teeth, the change in the configuration of the jaw is almost always obvious.

The angle of the jaw then has no support against the powerful traction of the temporal and masseter muscles during the acts of mastication and deglutition. The bone, though strong and braced, is a living tissue and must yield; we now have the face of the young and perhaps once beautiful, expressing a premature old age.

The action of the muscles in producing this change may be seen when these conditions are examined. The under jaw when closed upon the upper, is in contact with it only

[illegible] or chin, the condyle is articulated [illegible]y, and between these extreme points [illegible]powerful muscles, exerting great force [illegible] living tissue, and one endowed with [illegible] elasticity. The effects of such action [illegible] seen in persons of a lean, cadaverous [illegible] of the lower maxilla at an enormous [illegible] cavity, and with the front teeth in [illegible] those of the superior maxilla. The [illegible]encing behind and progressing forward, [illegible] and inferior incisors being the last to [illegible]raction of the temporal and masseter [illegible]ugh a long period, and when both jaws, [illegible] of teeth, come in contact with each [illegible]xilla will be found to have been elon-[illegible]e, that the symphysis menti, will be [illegible]e anterior portion of the superior max-[illegible] present an unsightly appearance.

[illegible]gradual wasting away of the alveoli is [illegible] of the eccentricities of this bone that [illegible]erfect is the change which it undergoes, [illegible]ly recognize in the smooth and rounded [illegible]rption is completed, the bone of which [illegible]ng. That both the outer and inner [illegible]sorbed upon the loss of the teeth, is a [illegible]o dentist will deny, but in what man-[illegible]hat peculiar agent is brought to bear, [illegible]s about such wonderful results, is at [illegible]Many have been the theories advanced, [illegible] the efforts made to account for this [illegible]nena, but as yet none have been ad-[illegible]gether satisfactory. I may therefore [illegible] considered presumptious, theorize a [illegible] Absorption we believe is effected by [illegible]vessels, as is deposition; we may find [illegible]bstance is deposited by the blood-ves-[illegible]beyond the bone under consideration.

In the development of the teeth, that dense hard substance known as dentine, is deposited by a very vascular organ the pulp, at first the deposit is only a granular substance which afterwards becomes dentine. That absorption of bone is caused by an increased vascularity in the periosteum which surrounds it, we will endeavor to prove.

After the formation of the enamel is completed, the teeth commence to grow very rapidly, and they grow as we have been told in the lecture rooms, from their roots upwards, the crowns being first formed. Now as the crowns of these teeth are surrounded by very delicate membranes, it is fair to suppose that the pressure, which must be considerable, upon these delicate membranes as the teeth advance, produces a determination of blood to them. That the pressure is sufficient to produce such vascularity, may be shown by the phenomena so often witnessed in the eruption of the dentes sapientiæ, the gums are often inflamed and swollen, sometimes throbbing and giving great pain, these symptoms together with the extreme redness, show that there is an increased vascularity in the parts, caused by the pressure of the tooth beneath. We have then a vascular membrane, with its blood-vessels distended; and may not the action of these produce absorption of the alveolus at the point of pressure, and thus allow the tooth to issue from its bony prison, this is true in both first and second dentition; in the latter operation, the pulps of the deciduous teeth are affected, and under the same influence as the surrounding parts absorb the roots of their teeth. We believe that the periosteum is the agent through which the absorption of the alveolus is accomplished; it commences its work as soon as the teeth are removed. There is deposited in the sockets of the teeth, by the periosteum which lines them throughout their whole extent, an osseous substance This deposit commences at the bottom of the socket and continues until the whole is filled. We believe that superficial absorption, takes place by similar means under the same governing and directing power, until the alveoli are

... When the absorption of the process ... n examination we will find that the ... eceded upon the inner one, giving a ... rd slope to the external surface of the ... the elevation resulting from the loss of ..., gives a different position to the chin, ... g of the face, and the approximation of ... e recognize the characteristic expression

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ARTICLE III.

The Circulation.

... M. BURKHOLDER, D.D S.

Ccontinued.

... sition, we may further say that the cir- ... t greatly depends upon the activity. of ... es taking place in it; that exercise of a ... anges in that part, and hence the circu- ... more energetic.

... n arises, as before stated, out of a union ... the arteries sub divide to form them, ... npoverished blood back to the heart, ... ch organ a fresh supply of nutrient ma- ... products of digestion and the recremen- ... old tissues is poured into it. All the ... lands are at work secreting from the ... ularly proper to themselves, or eliminat- ... at waste gates of the system those pro- ... n-nutritious and poisonous. Muscular ... fluences the rapidity of the venous cir- ... he compression of the vessels by their ... ves preventing a reflux.

... he heart, the contraction of the ventri- ... as also that of the auricles,but the con- ... les is synchronous with the dilitation of ... *ice versa.* The contraction of the heart

is called the systole, the dilitation, the diastole. The rate of velocity of the circulation in different animals, bears a relation to the energy of respiration and this energy is governed by the activity of their functions, especially those of the nervous and muscular systems.

The action of the propulsion of the blood by the systole of the ventricles, produces the Pulse, of which we shall speak by and by. The sound or impulse of the heart is also felt to correspond with their contraction and dilitation and is due no doubt to the closure of the valves, the long sluggish sound to the tri-cuspid and mitral and the short sharper sound to the semi lunar. The walls of the left ventricle are thicker than those of the right, and the contractile power is greater just in proportion as the purpose to be answered is different. Each of the four cavities hold about two ounces of fluid. The whole quantity of blood appears generally to be about one-eighth the entire weight of the body, and the round of the circulation is made in from 40 to 60 seconds.

The number of contractions of this great organ in a given time, is subject to great variations, even in a state of health, from divers causes, governed by age, sex, exercise, state of mind, time of day, &c., &c. The infant's pulse beats 130 to 140 per minute, at adult age probably not over 70 or 80, and at as low as 50 to 65 in the decline of life. The female pulse is somewhat faster. As before said all muscular exertion sensibly increases the heart's action. In standing the pulse will generally range from six to ten beats faster per minute than when sitting, and perhaps four or five beats faster sitting than when in the recumbent position.

The mental emotions have a very powerful influence over the action of the heart, as all know.

We have so far failed to speak of the fœtal circulation. The blood of the fœtus is oxygenated in the placenta, its borrowed lungs, into which the vessels for its passage out, the umbilical arteries, enter and ramify, ending in what is known as placental tufts, very similar in their office to the rootlets of plants; these dip into the blood of the mother.

[illegible] he umbilical vein, (and these vessels con-
[illegible] l cord) enters the abdomen at the umbil-
[illegible] to the liver, gives a branch to the right
[illegible] whilst a third and large branch, the
[illegible] ses directly across to the inferior vena
[illegible] ngled with this ascending current, enters
[illegible] nd guided by a valve, the eustachian,
[illegible] ugh the "foramen ovale" into the left
[illegible] oming intermixed with the current of
[illegible] ava ; from the left auricle it passes into
[illegible] d is thence impelled by its systole through
[illegible] the head and upper extremities and
[illegible] eins, is received into the right auricle and
[illegible] ch latter it is thrown out through a vessel
[illegible] arteriosus," which takes its origin from
[illegible] the pulmonary artery and opens into the
[illegible] rve, which prevents its return to the head.
[illegible] aorta along with that portion of aerated
[illegible] ead &c., did not require of each systolic
[illegible] ventricle, to feed the lower extremities
[illegible] e organs in that region, and, in part, to be
[illegible] centa for repairs, through the hypogastric
[illegible] erging from the umbilicus, become the
[illegible] and together with the umbilical vein con-
[illegible] al cord.

[illegible] nderstand why at birth, the brain is so
[illegible] roportion to other parts of the body, it
[illegible] blood all the while, the lower extremities
[illegible] o *put up* with the crumbs. Soon after
[illegible] traction of this duct takes place, it degen-
[illegible] s cord, as does the ductus venosus, becom-
[illegible] ment of the liver ; the same fate belongs
[illegible] arteries. The lungs having become de-
[illegible] birth and ready to perform their office,
[illegible] aratus at birth begins to act, in conformity
[illegible] g it, the blood ceases to pass through the
[illegible] but divides right and left and enters the

lungs, the foramen ovale gradually closes by the development of a membrane from its margin, and the child becomes, physically, an independent being.

The action of the heart is supposed by some physiologists to be caused by a regular supply of nervous influence from the cerebro-spinal system, and this idea was seemingly supported from the fact that when the brain and spinal cord are removed, or when large portions of them are suddenly destroyed, the heart's action is stopped, but the shock to the whole nervous system may be the cause of such result, for we have instances of the removal of the entire brain gradually, with no such results. Another proof against this is furnished by anencephalus fœtuses.

Carbonic acid has been by some writers assigned as the special stimulus or cause of its action, arguing upon the fact that if the breath is held the heart's action is very much increased. This, however, is doubtless due to a reflex action of the nerves calling upon the heart to send more oxygen to the tissues, to the brain, which feels its loss ; the heart responds and thus its action is increased—in other words, a conservative effort of nature to rid the system of the poison. Others believe there is no special nervous influence upon which its movements are dependent, beyond that of simple nervous irritability; and that the muscular heart is possessed of such irritability, that its proper stimulus, the blood, excites it continually to action. Opposed to this view we have the fact that the pulsation can be detected in the embryo, when the heart is yet but a simple mass of cells.

We may fairly conclude then that little or nothing is known of the prime cause of the heart's action.

Violent impression may suddenly suspend its action,—we have an exhibition of it in syncope.

After the blood passes in this jet-like manner into the arteries, it would proceed in the same manner, were it not for the equalization of its movement by the elastic coat of the arterial walls. The muscular coat regulates its calibre, and at a distance from the heart, the only sign we have of

[illegible] greater and lesser rapidity of the flow, [illegible] of the current, and is known as the [illegible]s, the pulse is a statement of the force [illegible] left ventricle, reflected from the heart [illegible]r transmission ; an exact report of the [illegible]ion of the heart and of the condition [illegible]elves.

[illegible]f the arteries communicate freely with [illegible] of the veins; if possible more freely [illegible] see the wisdom in this provision of [illegible] when we obstruct a main trunk by [illegible]

[illegible]onspicuous position in all diagnoses, [illegible]f perfect familiarity with its *host* of [illegible]ions, is apparent to every student of [illegible]d attain, truly, the title of a *successful* [illegible]

[illegible]tion with all its various phenomena is, [illegible]traordinary interest, and although, in [illegible]een only able to give a brief descrip- [illegible]ena, yet the appreciating and inquiring [illegible]ake up the subject and prosecute it to [illegible]tion.

[illegible]d *intensely interesting* study to him [illegible]ease, that would diagnose truly so many [illegible]re now certainly obscure, as regards [illegible], is—the blood, the changes which take [illegible] and in health.

[illegible] the scientific world is yet in its infancy, [illegible]erstood, until the immediate changes [illegible]te elements of the blood by foreign [illegible]d or gaseous, are explained, until, in its [illegible]s altered relations to the tissues is more [illegible]d, how can we expect to cure disease ?

ARTICLE IV.

Method of Mounting Gum Teeth on Rubber and Protecting the Joints.

By Jas. Gordon of St. Thomas

When I first began to practice the insertion of gum teeth upon rubber base, I experienced great difficulty in preventing the rubber from getting between the joints; I tried all devices I have seen recommended in different dental communications.

In some cases I succeeded by filling behind the joints with tin foil, but even this I could not always rely upon. At first I thought it was from want of skill on my part, but, after the lapse of time, when I had opportunities to examine a great many pieces, I became persuaded that the difficulty did not rest with me alone. I have seen the rubber between the joints of many finely executed dentures, marring the full appearance of the teeth and which, I am certain, must have been of great annoyance to the operator.

There is nothing more pleasing in rubber work, than to see a finished piece with the seams nicely brought together and perfectly clean. It is true that when block teeth are used, in a complete denture, the seams are few and one would not be much observed; but to our great regret after the piece is completed, we behold the sightly appearance of *dark seams* in connection with the beautiful mineral gum, which is a reproach to dental mechanism.

What I found most effectual and without a single case or failure, is to grind the teeth as for plate work, having no V-shapes behind the joint as recommended by a great number of the profession, and in the process of packing to put behind each seam a strip of English pink rubber, such as is manufactured by Messrs. C. Ash & Sons, London. This rubber it is well known, owing to the percentage of earthy matters it contains, does not flow, if I may be allowed this term, into irregularities like the darker rubbers. This quality

... suitable to protect the joints from ...r.

... to trespass on your time a little ...mention that it is essential to use just ... halves of the flask may be brought ...ing any undue lateral pressure; as ...nerally known if too much pressure ... most casas spread apart and destroy ... a substitute. The most expiditious ... in the process of packing, is to ascer- ... by any of the known methods, the ...uired for the case, and after packing ...ce of muslin between the mould and ... facilitate the opening of the flask ... screwed down, to see if the case is ...ere be not enough rubber add some, ... there is too much, trim away the ... scissors, remove the muslin, screw ... case is ready to vulcanize. This ...cuted without ascertaining the quan- ...; but the first is preferable.

...moulds with undercuts in which the ...s the opening of the flask, the follow- ...at is needed:—In placing the mould ...t the undercuts remain in the lesser ...her that when the flask is opened, the ... can be packed apart from the upper ...

... the undercuts, after which cover the ... rubber with a piece of muslin or, ... of tin foil, and when the upper sec- ...erpose a piece of muslin again and ...urse interposing two pieces of muslin ...event the adhesion of the upper rub- ...dercuts.

...e gum teeth can in all cases be used ... success.

CORRESPONDENCE.

ARTICLE V.

Letter from Dr. W. W. H. Thackston to the Southern Dental Association.

Farmville, July 21st, 1869.

W. H. Morgan, M. D., D. D. S.

Dear Sir :—Please accept my thanks with my acknowledgement of the "Circular" inviting me to participate with yourself and others in the effort to organize a "Southern Dental Association," &c.

I extremely regret to say that in consequence of severe indisposition in my family I shall not be able to be with you in Atlanta, but allow me to assure you that I am and will be with you and your confrerés in full and cordial sympathy —in earnest wishes for the success of your laudable enterprise, and in sanguine convictions as to the great good to result from the movement you are about to inaugurate.

I have long cherished the design of attempting such an organization of Southern Dentists as you now contemplate, but, from various causes, have deferred moving in the matter. I now rejoice that the initiative has been taken, and as the "Southerns" have at last "put their hands to the plough ".I trust there will be no looking back.

There is no egotism in the assertion that we have talent, skill, education and energy in the South to build up and sustain an Association that will not only honor ourselves, but will shed lustre upon our chosen calling and keep Southern Dentistry fully abreast with all the sciences in the onward and upward march to light and perfection.

Please in my behalf utter greetings heartfelt and strong to my brethern of the craft. All hail! My Brethern! God speed your glorious work! Allow me to stimulate your zeal, excite your enthusiasm and to nerve your energies for the to grand and noble task you have assumed. We have the material for a splendid Edifice; we have skilled workmen

[illegible] we have what is better than the cedar
[illegible] of Tyre or the gold of Ophir; we have
[illegible] n its requirements and its demands,
[illegible] ilities, and we have a land and a coun-
[illegible] d requite the proudest achievements

[illegible] field? What more inspirating pros-
[illegible]. What brighter promises ever lit up
[illegible] e, or inspired the hearts of its vota-
[illegible] er motives ever incited human action
[illegible] r Southern "Esprit des Corps"?
[illegible] ast the meridian of life, nearly 28
[illegible] e 3rd Diploma, that was issued by the
[illegible] Dental College in the world. Dr.
[illegible] and Dr. Mackall are the only two
[illegible] College older than myself, and they
[illegible] year, they graduated at the *first com-*
[illegible] ltimore College of Dental Surgery,
[illegible] I am the only surviver of my class,
[illegible] ose instructions I received, Dr. Thos.
[illegible] e surviver. I have lived to see nearly
[illegible], students and teachers, pass away, but
[illegible] red to see my loved and native South
[illegible] unshackled and disenthralled; to see
[illegible] sustained Dental Institutions, her
[illegible] her own Literature.
[illegible] nt you are now inaugurating as one
[illegible] portance to Dental Surgery in the
[illegible] with the gravest consequences, as one
[illegible] evil for our loved calling and our no
[illegible] here must be no failure. We must
[illegible] to that end I am with you *heart and*
[illegible] measure of my humble capacity. I
[illegible], and to co-operate with you in any
[illegible] to, or promote the objects and pur-
[illegible] n.
[illegible] ble misapprehension, I beg leave just

here to say, that *I am not a candidate for any of the offices or honors of the Association*, the post of "high private in the ranks" is the only position I aspire to, for in that capacity I am ready to serve the Association to the best of my ability.

With sincere wishes for your success, and highest regards for you and your associates personally, I have the honor to be,

Your Ob'd't Serv't,
W. W. H. Thackston.

ARTICLE VI.

Letter from Dr. Wm. Reynolds.

Columbia, S. C.

Mr. Editor :—

The conditions on which the privilege of replying to the proceedings of the Odontographic Society of Pa., as published in the February number of the *Cosmos*, was conceded, were such as to induce a postponement of an answer until a more favorable opportunity and circumstances should present themselves. These are now happily found in the rapidly extending circulation of the *American Journal of Dental Science*. As a subscriber, I ask the privilege of being heard through the columns of your Journal, in defense of my improvement in the construction of Artificial Dentures on moulded base. I am the more encouraged to prefer this request from the fact that an opportunity has lately been afforded you of examining into the principles embraced in this improvement, as they were exhibited to you in skeleton models and in finished specimens.

The Odontographic Society, whose savans like Otaheitan cooks consider that "no food is fit to eat till they have chewed it,"—in other words, that no subject connected with the Dental organs or the Dental art should be permitted to pass on to the profession or the public without the stamp of their approval, has seen fit to devote a whole evening of its preuious time to an attempt to keep back from the public

[illegible] on, so far as its influence or the influ- [illegible] might be instrumental in effecting it, [illegible] rtant improvements of modern date in [illegible] Ostensibly, but most disingenuously, [illegible] casion would have readers believe that [illegible] nsued upon the presentation of certain [illegible] f art"—Reynolds' Improvement—was [illegible] tigation of and pronunciamento upon [illegible] no single instance, was reference made [illegible] of this improvement and the intentions [illegible] fil. The gentlemen contented them- [illegible] e changes upon the old hackneyed sub- [illegible] Goodyear Company, oblivious to or [illegible] that the method before them was appli- [illegible] alone, but to any moulded base now in [illegible] used.

[illegible] lded metallic base were also before them [illegible] from which it might have been observed [illegible] did not choose to see, that this improve- [illegible] more intimate relation to gold plate [illegible] med by the Society, than to the ordi- [illegible] which it so justly condemns. Had the [illegible] med the responsibility of laying with- [illegible] sanction, these specimens before this [illegible] ouble of explaining to it, as in my ab- [illegible] to do, in what way this improvement [illegible] ion heretofore urged by the profession [illegible] e, as a base, and also how effectually it [illegible] less important objections which the [illegible] rds swaged plate for partial cases, the [illegible] en spared the ludicrous position it now [illegible] he gravity of "Little Peddlingtonians" [illegible] Society have assumed to decide upon a [illegible] is more charitable to suppose them all [illegible] than that any selfish motive operated [illegible] ecision.

[illegible] ent speakers or the occasion "saw no-

thing new in the specimens before them." In this they were right, since what was new and patented lay beneath the surface—concealed from view, and the vision of the members present not being more penetrating than that of ordinary people, the true nature of the improvement remained undiscovered throughout the entire debate. There are few operators, indeed, who have not at some time or other backed teeth with gold and imbedded them in rubber, but neither Dr. Nones nor Dr. Trueman have ever constructed cases on the principle carried out in these specimens. If they have, why have the profession and the public been so long deprived of its benefits? It is too late for them to look back with regret on lost opportunity. One of the objects of Patent-Laws is to bring out for the general good, inventions useful to mankind, that they be not suffered to die with the inventor, who from any motive might wish to keep them back. The masses have gone ahead of the profession in exposing the pernicious effects of swaged plates in partial cases. Few ask for them now; very few will have them. As it is with swaged metal, so it is with crude block rubber sets. The defects of these begin rapidly to force themselve upon public attention, and the deplorable practice of indiscriminate extraction is likewise becoming better understood and more generally resisted. No opposition can retard the steady progress of this improved method. The Goodyear encumbrance having ceased, as it will in a year or two, this method will be the means of recalling "our best men" to their laboratories, and of restoring the art in its perfection to their operating rooms, while the present crude style of unartistic rubber work will remain where it is, fulfilling its mission to the poor, unreproached.

Dr. Trueman, whose propensities are by nature iconoclastic, seems to care but little what source administers to his peculiar "pastime." The breaking up of old, offensive rubber sets, in which he delights to indulge, may be passed over as a matter of individual taste, but when the tendency extends itself to the breaking up of attachments of natural

...d re-soldering the fissures caused in his ... sturdy resistance, it cannot be allowed to ...

... begins to exhibit fissure, the evidence is ... the surface from which the impression ... has undergone some change, and that ... when a re-adjustment is demanded. By ... existing natural organs may still be pre- ... rcement after reinforcement is brought ... eated soldering, the merciless and une- ... long be maintained. The teeth are ... wly, it is true, but as effectually as if ... forceps of the heroic rubber worker. ... entitled "An examination of a re- ... Dental Association of 1868," in the ... the *Cosmos* for that year, the position ... t the general course of argument against ... d in favor of "gold and continuous gum ... ntures;" was fallacious, and calculated ... actice.

... n, that to the defects in the character of ... factured for moulded base were to be ... e evils alleged against rubber, and that ... titled to a full share of the opprobrium ... destruction of natural organs. It was ... discarding whatever has proved perni- ... s and combining all that is most advan- ... ould be constructed far more desirable ... in use. The public are entitled to the ... any improvement at the earliest mo- ... tely it is not always possible to reconcile ... nent which in this recently created pro- ... revail. Theories based on sound prin- ... e acknowledges and gracefully accepts, ... onflict with previous views; but the case ... thing like an innovation on the *mechan-* ... the ordinary causes which bind the

members of the several *trades* together seem to operate, and under an undefined apprehension of impending loss of prestige to their specialties, the members of dental societies not unfrequently bring themselves and their motives under the suspicion of the public. A perusal of the communication above referred to, and of the circular to be found elsewhere in this journal, is respectfully urged upon the Profession.

WM. REYNOLDS, M.D.

ARTICLE VII.

Lincolnton, N. C., Aug. 3d, 1869.

Editor of the American Journal of Dental Science,

DEAR SIR:—A case recently occurred with a lady patient of mine which is very singular.

Mrs.——, aged 30, was attacked with rubeola (measles) in December 1868, from which she suffered greatly, especially in the head.

She had worn a partial set of teeth (5 in number, 3 incisors and 2 bicuspids) for more than two and a half years with great comfort. After her recovery, to her great surprise and chagrin, she could not force her plate in her mouth, the plate being too large. Evidently the superior maxillary had undergone a change. The roof of the mouth becoming more flat, as the plate would rock upon reaching the hard palate of the mouth.

Will you be so kind as to inform me of the cause, or in any manner account for this singular or abnormal condition.

I am with high regard,

W. H. HOFFMAN.

Remarks. The probability is that in the above case the mucous membrane of the mouth was the part alone in which the change occurred, without there was present one or more cases of alveolar abscess about the teeth remaining in the jaw. We cannot conceive how the attack of rubeola could have had any effect whatever upon the bony structure, but that it should upon the mucous membrane is much more probable.—(ED).

...CTED ARTICLES.

ARTICLE VIII.

...lar Cystic Tumor of the Lower Jaw ...emoved by Excision.

...M.D., F.R.C.S., Civil Surgeon, Nagpore.

...o cultivator, aged about 35 years, made ...agpore City Hospital in April, 1868, for ...a tumor of the lower jaw, causing great ...n mastication and deglutition. Three ...had first noticed a small swelling of the ...olar teeth on the left side, which in the ...ained the size of an orange. It was now ...head, and extended from the zygoma to ... the ear backwards and outwards, al...ty of the mouth, and forcing the tongue, ...veolar process of the upper jaw over ... The mouth remained constantly open ...essure of the tumor, which appeared on ...theliomatous mass, containing loosened ...l surface presented several convexities, ...ence of separate cysts, was uniformly ...nd gave to the finger the feeling of crepi...rom the presence of fluid beneath thinned ... As he was suffering terrible pain from ...was immediately introduced into the two ...ts, one of which gave sixteen, the other ...ick grumous and straw-colored fluids. ... place in the size of the tumor, but the ...so great that pain almost entirely abated, ...eat rice. Excision of the diseased bone ... and agreed to, but as he felt much bet...g, and as the proceeding had to be post... on account of the severe illness of the ... left the Hospital, promising to return ... his mother-in-law, whose demise he de...rred.

[illegible] the end of March, [illegible] in appearance. The [illegible] ly; an extension of [illegible] and commencing to [illegible] ty of the mouth was [illegible] ion was impossible, [illegible], of course, far from [illegible] be gained by delay, [illegible] nt be again expected [illegible] frightened, the oper- [illegible] as possible on March

[illegible] rough the point of [illegible] right side was ex- [illegible] ommenced, the bone [illegible] nippers. The inci- [illegible] n the left, and the [illegible] ble depression now [illegible] nding into the tem- [illegible] culation was effected [illegible] ng, and the tumor [illegible] rtion of integument.

… portion was enucleated from the tem- … bleeding was not great, and that from the … red to cause just sufficient faintness to … from those divided in the later stage of … loroform had been administered by Dr. … Madras Medical Service, and all vessels … red by my assistant, Baboo Gopal Chun- …

… ed four pounds eleven ounces, and con- … of cysts developed between the laminæ … ed with an exuberant growth of epithe- … dilatation of the bone extended beyond … stopped just short of the point of division … body and ramus of the left side, no form … including the coronoid and condyloid … panded into cysts, the smooth surface of … with the glenoid cavity of the temporal … the maxillary joint; hence the ease with … on was effected.

… the operation, remained for some time … he rallied and took stimulants. At four … ully set in; pulse 150. On the following … re, which had never appeared necessary, … m the tongue. There was high fever and … P. M. After this the progress of the case … improvement, the afternoon febrile exac- … diminishing and the wound healing by … pt at the point of exit of the ligatures. … ligatures had all separated. Speech and … n improved daily, and at the end of the … Hospital to proceed to his home in satis- … —*London Med. Times & Gazette.*

ARTICLE IX.

New Operation in Dental Science.

Reported by Q. L. ADAMS, D. D. S.

An operation was performed in this city during the months of May and June, 1860, by Dr. C. E. Blake assisted by me, which is new in dentistry, and a description of which will be of interest to those in pursuit of dental science.

The gentleman upon whom the operation was performed, had been wearing a superior denture of artificial teeth, and having worn the remaining inferior teeth very much away, nearly to the margin of the gums, the four first inferior molars and second right bicuspid having been removed several years previously, the remaining portions of the dens sapientiæ had been forced very much forward.

May 13th. Applied the spray of sul. ether to the left dens sapientæ, and, when sufficiently benumbed, cut into the nerve cavity, which was but a slight distance, and extirpated the nerve with small barbed broaches designed for the operation, the sensation of pain being very slight. Owing to business engagements, the case remained under attention.

May 20th. After preparing and cutting threads with a screw top, inserted two screws of pure gold three-eighths of an inbh in length, and one-eighth of an inch in diameter. As the posterior root extended back, the back screw had to be fitted in first, and curved, to bring the upper ends of the two parallel, where the threads of the screws had been re moved, and the two adjusted, filling up the threads and remaining space with Roberts' Os-artificial. The amount required was very little; as the screws nearly filled the orifice.

After the operation came a plate of pure gold, in thickness about twenty-nine by guage, and one sixteenth of an inch larger than the grinding surface of the tooth. Two openings were made in close proximity. The grinding surface of the tooth had worn down a little concave and uneven;

[illegible] therefore put on and tapped down with [illegible] mallet, to fit the surface perfectly by an- [illegible] a hard plate for service, composed of [illegible] one-eighth of an inch in thickness and [illegible] the tooth, fitted to the first plate, with the [illegible] counter-sunk around the ends of the screws. [illegible] taken off, and the two plates soldered to- [illegible] then placed on the under surface of the [illegible] the same size, sixteen layers of gold foil, [illegible] adaptation impervious to the fluids of the [illegible] corners of the tooth were then slightly [illegible] to make a better fit, and to avoid any [illegible] the corners in the adaptation.

[illegible] being ready and the usual precaution made [illegible] compound plate or cap was put on in its [illegible] ends of the gold screws were riveted [illegible] serrated pointed pluggers, and by the use of [illegible] the remaining part of the counter-sunk [illegible] with gold foil and sponge gold all solid and [illegible] margin of the pure gold plate, together [illegible] beneath, were then tamped down around [illegible] tooth. The perfect manner in which the [illegible] was tapped over and around the margin [illegible] no doubt of its security. About eight [illegible] used in the last operation.

[illegible] corresponding molar on the right side [illegible] and the nerve-pulp extirpated.

[illegible] A successful operation was performed similar [illegible] subsequently, three bicuspids, and one canine [illegible] capped in the same manner, with the ex- [illegible] one screw was inserted in each fang—some [illegible] was plugged around the screws in the [illegible] perfect fastening.

[illegible] of these operations as above described, [illegible] uneasines or pain experienced by the pa- [illegible] first bicuspid, on the right side, which [illegible] alveolar abscess eight years previously

and was quite sensitive and painful during the operation, but yielded readily by the application of an astringent wash, and in a few days was restored to its former tone of health.

The crowns of several of these teeth, some eight months previously, had been built up solid by the use of the mallet, with adhesive gold, but after a few months' use it was discovered that they were rapidly wearing away, caused by the grinding force and hard surface of the artificial teeth coming in contact with the pure gold. This suggested the operation of capping with hard metal as the most permanent manner of prolonging their use.

The above operations being new in the practice of dentistry, and having taken an interest in their performance, I take the liberty to give them the name of Compound Cap Restoration.—*Pacific Med. & Surg. Journal.*

ARTICLE X.

Fatal Case of Tetanus Resulting from the Removal of Ten Teeth from the Upper Jaw while under the Influence of Nitrous Oxide Gas.

By H. K. Steele, M. D., Dayton, Ohio.

J. E. P., aged 19, of strong constitution, robust and in full health, on the 1st of March last, while under the influence of nitrous oxide gas, administered by a dentist, had ten of the upper teeth removed, for the purpose of having a full artificial set inserted.

He felt some of the pain of the operation, but was well able to endure it and recovered, apparently, from its effects, and continued at his occupation, that of farming. On the 7th of March a twitching of the lower lid of the right eye, with a tendency in it to "draw down," was observed by himself and friends. On the 8th he applied to the dentist for relief, who made an external application of chloroform, deeming that sufficient. The left eye, however, became similarly affected, and other symptoms were gradually manifested until the 14th, at which time I first saw him (the

ty—7 miles—being, probably, a reason
r called). There was then inability to
nore than three quarters of an inch, a
f the masseter. There was retraction
mouth, and an occasional clonic spasm
he abdomen.
ce of a cathartic, with full doses of bel-
e of potassa, and ice-bags to the spine,
sleep was obtained that night; without,
of the jaws, or entire subsidence of the
On the morning of the 15th there was a
ation of the symptoms, the spasms of the
at times being very painful, a drop of
chin or running down the neck, pro-
h their full force. Deglutition performed
.
nhalation, moderated the pains and gave
Atropia was substituted for the bella-
s indica for the potass. bromide, with
en at night.
ad slept two hours during the night after
e, but a continuance of it did not main-
morning the disease is aggravated. He
ed, and occasionally has to be raised to
n—the spasms affecting all the muscles
the extensors predominating.
nward the disease increased in severity;
s, those controlling the respiration, being
the others. There was at no time opis-
thotonos, but the body was powerfully
ght position. He was not able to remain
last two days, and it was only whilst there
the spasms that he could sit in a chair;
he was held on his feet, and required the
to be kept open, which, in the very in-
as an aggravation to his disease and pre-
affording him relief. He died on the

19th, almost in a standing position, having just sunk down exhausted by the violence of a spasm.

The treatment may be summed up as follows :—Ice-bags to spine; morphine; chloroform by inhalation; cannabis indica; bromide of potassium; belladonna; atropia; extract of calabar bean by hypodermic injection, one third of a grain in solution, and one grain per ore. The remedies affording the most relief are in the order in which they are named.

Chloroform, for the last two days, affected the respiration dangerously. The hypodermic application of calabar bean was not in the least beneficial.

Dr. Jno. Davis, of Dayton, saw the case with me the last three days.—*Cincinnati Lancet and Observer.*

ARTICLE XI.

Removal of One-Half of the Inferior Maxillary for Osteo-Sarcoma.

By S. R. Beckwith, M.D.

Mrs. B——, aged thirty-six, observed, some three years before I became acquainted with her case, a small tumor on the outer portion of the lower jaw, about mid-way between the symphysis and angle. It soon increased in size; at times was painful. Her physician was consulted, and treated her for six months. During his treatment the growth was slowly yet steadily increasing, until he advised removal as the only successful treatment. She would not consent, and did not again apply for treatment, preferring to let it grow uninterrupted, until it had filled the cavity of the mouth and very largely distended the cheek. For months she had not been able to take any solid food, from inability to masticate, and want of room for the introduction of food. Her nourishment was fluids taken through a tube. She had become excessively emaciated, and fearing that she soon would die, was induced to visit me. From the absence of any marked constitutional disturbance during its early growth, and its large size, the sensation of firmness being less than in exos-

[illegible] ith the peculiar crackling sensation noticed [illegible] ed upon, gave me no difficulty in diagnos- [illegible] of osteo-sarcoma, and I advised resection [illegible] n of one-half of the lower jaw. She [illegible] as her mind had been made up before [illegible] t an operation would be necessary, and [illegible]

[illegible] before the class, and with the assistance of [illegible] Bissell, it was removed in the following [illegible] ient was seated in a chair, with her head [illegible] held by an assistant. After the administer- [illegible] an incision was made along the base of [illegible] angle to a short distance beyond the sym- [illegible] cal cut extending from the termination of [illegible] gle of the lips. The flaps were dissected [illegible] freely exposing the tumor. The jaw was [illegible] inch from the centre, toward the sound [illegible] se had extended beyond the symphysis. [illegible] now allowed to become conscious, for fear [illegible] by blood flowing into the trachea during [illegible] operation.

[illegible] as very much exhausted, and we gave her [illegible] and allowed her to lie down for a short [illegible] expressed a desire to have us proceed. A [illegible] around the jaw, and forcibly drawing it [illegible] achments were divided, with a strong scal- [illegible] The bone was now drawn outwards and [illegible] its upper attachments on the stretch as [illegible] A bistoury was inserted behind the cor- [illegible] t below the zygomatic arch, and the tem- [illegible] divided at its insertion. The jaw was now [illegible] articulating the condyloid process, it was [illegible] th force, so as to remove it from the artery. [illegible] ment and pterygoid muscles were sepa- [illegible] w was freed entirely, save some slight at- [illegible] mouth, near the angle, that had not been [illegible] Very little blood was lost during the oper-

ation, and but few ligatures applied to bleeding vessels. The wound was closed by a few wire sutures, and straps applied between them; pledgets of lint, wet with a weak solution of *Calendula*, were applied to the wonnd, and held in position by simply a handkerchief.

The patient remained under our care three weeks, and then returned home. The wound healed almost its entire course by the first intention, and there were no untoward symptoms during the convalesence. Great care and attention were given the patient for the first few days after the operation, to prevent sinking, although she had no symptoms of dangerous exhaustion, but these were feared from her feeble condition prior to the resection.

Three years after the operation I saw the patient, and the deformity was not as great as I had anticipated. In place of the bone, a fibrinous deposit had filled up the gap in such a manner as to tolerably well preserve the contour of the face, and she was in good health.—*Med. Investigator*.

ARTICLE XII

Contour Fillings—When are they Indicated?

By H. L. Sage, Bridgeport, Conn.

Although some diversity of opinion may exist relative to the *when* and *where*, in considering the indications of contour filling, I trust no apology is necessary for presenting a brief *resume* of the cases in which such indications exist. In coming to a conclusion much judgement may be required in what may, at first sight, appear a plain case. Whether or not we are, in some cases to shock the good taste of nature-worshipers, in order to avoid a greater and more serious calamity. The aim in the construction of the artificial seems to be to counterfeit nature so closely as to place its false character beyond detection, at least by the mere casual glance of the eye. Hence, the objection that obtains in the minds of many to anything that falls short of such a standard, and hence the objections to contour fillings. Health,

...nent good are often sacrificed to this false ..., that many prefer to lose those valuable ... the teeth, in order that they may be re- ... substitutes *in full*, that do not show to ... their true character, rather than to have ... st structure replaced in a more useful and ... ause it shows an infringement of the pleas... these patients ever consider what they ... ed of their gold and porcelain? "Be- ... oose the least," though the greater may ... as it really is. Every honest Dentist ... t is at times to persuade a patient not to ... teeth to the "tender mercies" of the ... manipulator. And if he lives up to his ... o compromise his convictions in this res- ... unfrequently expect to exchange a pros- ... reward, for self respect, and "a con- ... ense." The rule should be, conceal the ... of your operation as much as possible, ... ense of the future welfare of the organs ... e.

... the question under consideration, I would ... four fillings are indicated, first, when the ... ity are so frail that there is danger of ... mel in putting in the filling, notwithsand- ... be used, or there would be a probability of ... from the filling after its insertion, by the ... on of the food. In such a case it is much ... t away the frail edges and restore to the ... h gold, *i. e.*, sacrifice beauty to strength ... d in the long run to comfort. When the ... ity does not necessitate the cutting off ... urface at the point, but it takes on the ... r shape, and the labial and lingual walls ... much so as to make it unsafe to leave ... e dangers above stated—in that case it is

best to cut away with a fine, half-round file, until strong borders are secured and then restore with gold.

Second—Contour fillings are indicated when, in the case of the incisors or canines, much space is left between them by the decay of the approximal surfaces, thus interfering with speech or destroying the natural symmetry of the teeth.

Third—In the case of the bicuspids and molars, when much of the tooth structure is broken away or the borders of the cavity are frail, and it is desirable to obtain as much grinding surface as was had in the original shape of the tooth.

Fourth—In almost all cases when the dentine would be exposed to the chemical action of the fluids of the mouth, thus inducing decay; and if it is admissible to leave it exposed at all, which is questionable in the majority of cases, the front teeth would constitute the exception. Generally speaking, the borders of the cavity, when the enamel has been cut away and the dentine exposed, (which should never be done unnecessarily) should be protected by building out and lapping over, more or less, according to the requirements of the case. If left without protection, as in the case of the front teeth, the dentine should be highly polished by the usual method.

When are contour fillings *partially* indicated?

First—When, in the case of teeth very much crowded, it would not be necessary to build out the tooth to its original shape fully, but only enough to serve as a protection to the dentine, though much of the structure is lost.

Second—In cases of grinding teeth when three-fourths, say, of the crown is gone, one approximal surface, for instance, being perfect, and it being very difficult, by reason of the close proximity of caries to the nerve, to obtain sufficient retaining points to render a large filling firm in its attachments. Then build it out no more than is compatible with safety or strength, for the more surface you expose to friction, in such a case, the more liable would the filling be to loosen or fall out.

to make a square cut across the frail
bial to the lingual surface, semi-circular
ase may require, leaving the edges quite
eveled, so that when the gold is built
it may present a joint with the tooth as
be possible to unite two perfectly plain
f wood, and more so, impervious to the
and this idea should be carried out, be-
ervical portion and extending to every
the connection being perfect inside and
of gold should be allowed beyond the
ld be flush and plump with it.

h, it should not be so full as to prevent
antagonizing properly, and if there is
in the amount of force of occlusion on
face, the teeth without fillings should re-
as it is always unpleasant to the patient
seem to long in biting upon it, to say
y produced to both teeth and filling. By
practice, briefly stated, my success has
good results. Perhaps others may sug-
s, or improvements upon the foregoing.

ARTICLE XIII.

lation of the Upper Maxillary Bones.

, M.R.C.S., L.S.A., L.M., A.K.C., etc.

re the injuries which usually happen to
pper jaw that no attempt has ever been
n aware, to establish a systematic classifi-
special rules for their treatment. Feel-
any addition to the instances already
acceptable to those who are interested in
ure to give a short account of a case
rred in my own practice, which to the
s unprecedented in the extent of its injury
ult in the annals of Surgery.

In August last, W. S., a labourer, aged 30, was driving a wagon when one of the horses suddenly fell and knocked him down, with his head under the animal. The ground was very hard from the previous drought. When first seen he was sensible, though unable to articulate distinctly; his face was bruised and swelled; his lips and teeth slightly apart, the upper jaw projecting somewhat over the lower, and unable by any effort to be closed upon it. There was no great deformity of the general expression of the face. On touching the cheeks, they appeared to contain a quantity of "loose bones;" on both sides the malar bones were displaced and movable. On laying hold of the upper incisors, the wedge-shape portion of bone corresponding to the position of the superior maxillæ and malars was so movable that the impression conveyed to myself and my assistants was that, by a forcible twist, the whole could have been brought away but for the attachments to the soft parts. At the articulation of the nasal bones with the frontal and lacrymal there was a very distinct separation. The floor of each orbit was depressed and freely movable, the left rather more than the right. The entire jaw seemed to be protruded forward, the teeth being abnormally prominent and overhanging. The alveolar ridges and other portions of the bones were unbroken. The horizontal plates of the palate bones were severed from their connexion with the vertical, and with their articulation with the internal pterygoid processes of the sphenoid, which could be ascertained, on passing the finger along the roof of the mouth, by their extreme mobility. There were no external wounds beyond bruises and abrasion, through œdema and ecchymosis were subsequently considerable.

The appearances above described were clearly made out and recognised by all present, Professional and otherwise, and the disarticulation was beyond a doubt, inasmuch as the bones, in their wedge-shape entirety, could be freely moved backwards, forwards, upwards, downwards, and from side to

[illegible] n of the malar bones from their articu- [illegible] stinct. For a considerable time sense [illegible] and the tears, by reason of a slight dis- [illegible] ncta, coursed over the cheeks. At no [illegible] great pain.

[illegible] nd trouble, I carefully adjusted a gutta- [illegible] parts. A horizontal slip passed across [illegible] xerted backward pressure on the alveolar [illegible] endency to eversion. This was joined [illegible] brought from the top of the head (cor- [illegible] coronal suture) beside the cheeks, and [illegible] horizontal slip passing from the back of [illegible] cciput to either side, to steady and keep [illegible] alar bones. These were carefully pad- [illegible] pongio-piline, which readily adhered to [illegible] hen hot. Over all, a bandage was put, [illegible] wer jaw on the upper by exerting upward [illegible] ed through an opening of his teeth with [illegible]

[illegible] ive or six weeks I removed the gutta- [illegible] nd put on a starch bandage for another [illegible] everal months before he could bite solid [illegible] quite convalescent, and very little the [illegible] t, though, as if to bear testimony to the [illegible] he injury, the upper jaw appears to be [illegible] and the depressions between it and its [illegible] normally wide.—*London Med. Times*

ARTICLE XIV.

How to Wedge.

[illegible] in the preparation of cavities, is limited [illegible] number of operations than formerly. [illegible] its place to a great extent, and with re- [illegible] ults. The unsightly V shaped spaces [illegible] bicuspids are not as common now as

formerly. In only rare cases are these openings *now* admissible.

TO GET ROOM BETWEEN THE CENTRAL INCISORS.

If the cavity is cervico-approximal, drive a wedge of orange wood or hickory near the gum. Now drive one, wider than the former, between the crowns. After these have remained a few minutes another may be driven between the crown wedge and the approximal surface of one of the teeth operated upon. The cervical wedge is now loose and a thick and narrow one may be driven in its place to remain during the operation of plugging. If other teeth are to be filled, operations may be commenced upon them, and time allowed for the wedge to swell and the teeth to separate. In this way a great deal of space may often be obtained, even when all the incisors are in contact. If there is already space between the lateral incisors and canines we may wedge between the lateral and central incisors first and then wedge the centrals.

Caution.—There is more *danger* of wedging between the centrals than between any other teeth in the mouth. Especially in *young* subjects is this the case. For it must be remembered that there is a suture between the palatal bones in the median line, which may be forced open, and grave consequences ensue.

Frail teeth must be tenderly treated, and softer wood used than when the teeth are stronger.

Wedging may be applied to the molar teeth by using hickory, and cutting the wedge half off before driving it; for the portion to be driven can be bent at an angle and thus made to enter the place desired, when a straight stick could not be.

Many practice the slow process, using cotton, rubber or wood, removing the wedge every day or two.

My experience is in favor of rapid wedging. By the slow process there is often a great deal of pericementitis and periostitis, which of course must be combatted with appropriate remedies.

ess there is some immediate pain, but
efore the wedges are removed, and any
teeth afterwards may be removed as
Tincture of arnica may be applied to
of the teeth after the wedges have been
ome in direct contact with the perios-
process, and the pericementum.
l doses of mercury, say a fiftieth of a
useful in case there is inflammation of
either mode of wedging. C.
rnal.

HLY SUMMARY.

—The following extraordinary case of
a late number of the *Indian Medical*
by Dr. Macleod Cameron, Civil Assistant
namun, a Mussulman, aged 15, was brought
0th, by her parents. They stated that up-
e they had observed a small tumor near
jaw on the left side. It continued to in-
practitioners failed to give relief, and at
e, they had brought her to have it removed
was a tumor on the left side of the face,
a tea-cup. The skin slid easily over it,
ent part was dusky red, and apparently
ing. The tumor was firm, of a bony con-
equally connected with both jaws. The
e mouth nearly closed, and the girl com-
In spite of the suffering she had under-
flesh, and the right cheek was plump and
g the lips, to inspect as far as possible the
I observed the ends of two flat bands of
l from the tumor into the mouth. On in-
at minutely (which was a matter of some
erpetually starting back, and complaining
ed certain lines which seemed to indicate
eces of cloth inserted into a cavity in the

tumor, or that cloth of some sort had been recently placed in contact with them, so as to leave its impression. I asked the parents if any cloth had been introduced into the mouth; but they asserted that such was not the case, and the girl corroborated their statement. I now seized the band with forceps, and, using a little force, succeeded in removing it; the girl shrieking loudly and endeavoring to seize my hand. The band was simply a piece of cloth. On examining the mouth I saw what was undoubtedly a second piece of cloth, which I also removed, and thus I went on removing piece after piece till every vestige of the tumor disappeared. The girl looked foolish and sulky. The parents seemed stupefied, and could not at once realize that their daughter's illness was pure deception. They brought her to me again on the following day. There was not the slightest trace of disease. The teeth were sound; the jaws well formed. The right cheek was, as I have said before, plump and round; the left was thin, and hung flaccid and void of expression. The centre of the cheek, which formed the most prominent part of the tumor, was now shrivelled up, like the skin of a withered apple. The tumor was composed of twenty-three pieces of cloth, weighing, when washed and dried, four ounces.—*World*

Biting the Snake to Preserve the Teeth.—The superstition mentioned in the following item prevails very extensively in some portions of the South and West.

An old lady, in Iowa, complimented on the beauty and preservation of her teeth, ascribed it to having "bitten the snake." She explained that in childhood her father held a rattlesnake by the head and tail, and each of the children bit along the whole length of the backbone, just indenting the skin, as a preventive of tooth-ache and decay, and the old lady believes to the present in the efficacy of such an operation.—*The Medical & Surgical Reporter.*

Styptic Paper.—A mode for carrying about ferric chloride as a ready styptic has been invented in Paris, which consists in dipping paper into a decoction of 1 lb. of benzoin, 1 lb. of alum in 4 gallons of water, which has been kept boiling for four hours, with renewal and skimming. The paper is left in the filtered

saturated ; it is then dried, and (neutral) of chloride of iron ; this rapped in an impervious cover.—

the best, and certainly the least extremely well adapted to destroy cences. Not painful, and not liable . It has been successfully used to on or near the os uteri.—*Druggists*

gs.—A metallic tube composed of n inch long and weighing eleven of coughing expelled from the lungs living in New York City. The tube, a-rubber air ball, was two years ago pper part of the larynx, and thence, by emetics, was lodged in the lungs. riod mentioned, the girl suffered from he chest and from continued coughing. s the tube was ejected. This occurrtion of the remedial force of nature ul in affording relief when all the edicine have been tried and failed.—

ctor, Jr.. the able editor of the *Phila- y*, has analyzed the preparation sold *uininc*, and says it is not quinia but *ia*. precipitated from the sulphate of ted with an impure glycyrrhizin pre- Cinchonia, he says, "however taste- s its commercial value approach that is made to do in the garb of 'sweet s want cinchonia they can get it by n accordance with our ideas of fair new substance."—*Pacific Med. and*

Mercury Fumes.—The dangerous action of mercury upon the health of laborers in looking-glass manufactories is well known. According to a recent investigation, however, it is shown that it is a mercurial dust rather than the sublimed vapor that produces disease. This dust can be prevented from flying by adding one-half per cent of sodium to the mercury, which completely neutralizes any such tendency. The saving of the mercury more than equals the cost of the sodium.—*Med. & Surg. Reporter.*

Strange Montrosity.—We have received the following singular account from a gentleman in New York:

"A correspondent of the *Dantzic Gazette* writes as follows from Dirschau: 'Last Sunday, February 1, at Schliewen, near Dirschau, a young and blooming shepherd's wife was delivered of a girl otherwise sound, but having on the lower part of her back (*auf unterm Ruckentheile*) a tumor as big as two good sized fists. In this tumor, which is covered by the skin, is a very lively fœtus, whose well-developed mass may be felt through the walls of the tumor. Its limbs indicate a growth of from five to six months. The father called in the health commissioner, Dr. Preuss from Dirschau, and begged him to remove the tumor together with the fœtus. The Doctor, however, after he had long and carefully examined it, declared that there was a possibility in this extraordinary case, of the child in the tumor (whose existence and active motions were palpable to all present) coming to fruition. No physician could be justified in destroying this marvellous being. Rather it ought to be protected and cherished. The new-born girl is of unusual strength and beauty, and takes the breast very cheerfully.'"

Position of the body Favoring Sleep.—Dr. Kenney, in the *Dublin Quarterly Journal*, gives some curious facts on this subject. He says: I had read in some book that sleep was often prevented from the position of the person not being in the right direction, and that to insure the soundest sleep the head should lie to the North; and, strange as this idea may at first appear, it has more in it than might be supposed. He then gives several instances in which this idea was carried out with satisfactory results in obstinate wakefulness, where narcotics had failed to induce sleep.

... nerves and notions that there is no tell- ... ts may sometimes follow even a change of ... highly nervous and susceptible tempera- ... *Reporter.*

... *After Congelation.*—Dr. Richardson per- ... arkable experiment in confirmation of an ... made by John Hunter. Hunter observed ... e frozen, in the act of thawing muscular ... lace. Dr. Richardson has devised an ex- ... fact may be audibly and visibly demon- ... enuded muscle be first frozen with ether ... ed in a freezing mixture, it may be after- ... d by being held horizontally by a piece of ... . If one end of the cord be made fast in ... water and the other end be fastened to ..., and the temperature of the muscle be ... y placing a spirit lamp under the vessel ... nd heating it to 125°, the muscles contract ... d forcibly to fire off the pistol.—*London* ...

...—The *Lancet* says toothache can be cured ... vert's carbolic acid. A gelatinous mass is ... portion of which, inserted in the cavity of ... ably gives immediate relief.

... n *Dentistry.*—This statement appears ab- ... ists used gun-cotton as an explosive agent; ... uite recently the collodion mode of gun- ... vaporation. as a varnish, into thin sheets, ... bstitute for the objectionable vulcanized ... support of false sets of teeth. For this ... s are softened by ether, and pressed to- ... hich is made in a way similar to that in ... tinum or India-rubber sets.

... s to the vulcanized rubber sets of teeth is ... an only be corrected by vermillion, which ..., somewhat similar to that of the gums.

Vermillion, however, being a compound of mercury, seriously affects the health of some persons, whose peculiar constitution renders them very sensitive to the influences of this pernicious metal.

In drying, collodion contracts considerably, and the only additional trouble, in making objects of dry collodion, is to make the moulds larger, by repeated casting and recastings in Plaster; the plaster expanding every time a little, the last mould obtained may be sufficiently enlarged to compensate for the shrinkage of the material. Sets of teeth made on collodion are much lighter and stronger than on any other material thus far employed for that purpose, and, no doubt, will soon come into general use in the United States, as the dentists of this country are among the most progressive in the world.—*Druggists Circular.*

New Hæmostatic Collodion.—Dr Carlo Panesi (*Arch. Med. Belges*) has prepared a collodion similar to that of Richardson;

Officinal collodion	100	parts.
Carbolic acid	10	"
Pure tannin	5	"
Benzoic acid	3	"

To be agitated until the mixture is perfect.

This collodion has a brown color. Submitted to evaporation it leaves as residue a pellicle similar to that of the ordinary collodion. It adheres strongly to the tissues to which it is applied and coagulates the blood instantly.—(*Union Med. de la Gironde*) —*Med. Record.*

Change of Chemical Nomenclature.—Instead of sulphate of copper we shall now say copper sulphate, or cupric sulphate; instead of sulphate of iron, ferrous sulphate; instead of per-sulphate of iron, ferric sulphate. Bicarbonate of soda is monosodic carbonate, or hydrogen and sodium carbonate or hydrosodic carbonate Sesqui-carbonate of soda is dihydro-tetrasodic carbonate. See *Fownes' Chemistry*, the latest authority. In another decade or so, we shall have another revolution in nomenclature. And why not? Do not the fashions of ladies' bonnets change?.—*Pacific Med. and Surg. Journal.*

... learn from the *Journal des Connaissances* ... last sitting of the French Academy of Med- ... n communicated the substance of an essay ... a sensation. It was a posthumous disquisi- ... acid, found among the papers of the late ... Schonbein, of Baden. The question discus- ... re was a test for the above-mentioned liquid ... Liebig and M, Buignet, which, within cer- ... al the presence of prussic acid, but are in- ... uantity and detect a crime with certainty. ... hen proceeds to describe a reagent discovered ... icate enough to bring out to view even the ... rop, whether diluted with water, or vapor- ... cumstance affording new proof of the incal- ... of matter. Dr. Scouttetten, who lives at ... his communication, that he had repeated the ... nbein's, experiments, with the aid of two ... in and Pont, and that he begged to submit ... r prepared by himself to the Academy for ... ecimen forwarded was of the kind called ... had been soaked in a solution of three ... sin in 100 gms. of alcohol. To use it, a ... gr, of sulphate of copper in fifty gms. of ... ld be made, and the paper which is white, ... One of the latter being wetted with the ... xposed to the action of the minute quantity ... dtssolved in water, and suspended in the ... then instantly turn blue. Dr. Scouttetenn ... ips of paper will be useful in examiuing the ... inal waters or syrups containing a very ... e acid. The paper need only be placed on ... k of the phial containing the medicine, and ... at once become visible. Various other ex- ... bed, all tending to the same result.—*Med.* ...

... *d.*—*Vitriol* mixed with alchol, is used in ... er drink. Of course you do not take the ... nal strength ; you stir one part of the acid

by measure, together with three parts of rum, gin, brandy, or whiskey, and put a small teaspoonful of the mixture in a tumbler of cold water, flavored with a dash of lemon-raspberry or some other syrup. It is said to be good for the stomach, and does not increase perspiration as do some drinks containing vegetable acids. It also has a tonic action on the vascular system. Continental *Cafes* use this mixture in concocting their *liqueurs*; but it would be much safer for the teeth and stomachs of the drinkers to use *Phosphoric* acid in place of the Sulphuric.—*Med. Gazette.*

Remedy for Carious Tneth.—Nitric ether and sulphate of alumina are mixed so as to form a paste, which is applied to the cavity. It never occasions any inconvenience, the most violent tooth-ache is promptly relieved, and, after several applicatlons, the affected tooth becomes insensible.—*Sweitzer. Wochenschr.*—*Am. Jour. of Pharmacy.*

EDITORIAL DEPARTMENT.

The American Association for the Advancement of Science—This Association met at Salem, Mass, in August last, and continued one week, being largely attended by scientific gentlemen from all sections of the country. Professor Agassiz, as usual, was very entertaining and was the life of the meeting.

More than one hundred papers were read, many of which were listened to with the deepest interest. The "Antiquity of Man" was the title of one of the papers read, which, although it shed no new light upon the subject, was yet a very interesting one. Prof. Marsh exhibited some fossil bones which were found at the bottom of a well, and had been forwarded to the Association under the label of "Human Bones found in Tertiary Deposits." Prof. Marsh, however, proved them to belong to an extinct species of horses, whose normal height was but two feet. One entire evening was devoted to some strange experiments with the human heart, conducted by Drs. Groux and Upham. "Dr Groux was born without any breast bone, and the action of the heart was shown in him as in no other human being. He exposed his breast, and by sundry ingenious arrangements, including a connection with a telegraphic instrument, "revealed to ear and eye the threefold motion and sound of the heart." He also, says a report of the evening's examination, showed how its position changed by strong inhalation and exhalation, and finally carried

... experiment of causing its motion entirely to ...ds, as was tested by two physicians, one hold- ...he other listening with a stethoscope on the ...telegraphic apparatus was put in connection ...ty miles away in Boston, and the heart-beats ...d patients there made to sound out sharply ...veal themselves also to the eye by means of ...alcium light on the wall. We counted' says ...y heart strokes a minute of a healthy man, ...undred and thirty strokes of a fever patient, ...lar, interrupted pulsations of one with heart ... something solemnly impressive in these ex- ... the seat of life."

...*Redman.*—We are gratified to learn that the ... *College* has added to its regular course of in- ... on Pharmacy, Medical Jurisprudence, and ...try, and that the latter chair has been offered ... Redman, D. D. S., of Louisville. ...atment could have been made, and we congrat- ... of this medical college upon their choice, ...g accepted the position. Dr Redman's name ...ental profession as the inventor of Redman's

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ARTICLE I.

Microscopy of the Dental Tissues. New Series.

By S. P. Cutler, M.D.,D.D.S.

Continued.

Physiology, Histology, and Pathology.—In my last article I spoke of the physiology of muscularity, I stated that by that mysterious power or force called volition, muscles of volition responded by contraction when the volite charge was turned loose into such muscles by letting loose the trigger that held such force in static abeyance.

When this force is let loose and muscle contracts, antagonizing muscle relaxes from its state of pressive tension in consonance with muscle côntracted, and continues so long as contraction continues, and when contracted muscle relaxes the former balancing equipoise is resumed, the relaxed muscle now contracts slightly, and formerly contracted muscle now, in turn, relaxes, and both fall into their normal state of rest, tension now being equal. In the function of contraction and relaxation there was formed or existed a cycle and afterwards another cycle corresponding to the pre-exist-

[illegible] cular contraction there must have [illegible] e, the positive, causing contraction, [illegible] the other, causing relaxation, nega- [illegible] rent and the other efferent at point [illegible], and the order renewed at the static [illegible] energy is converted into dynamic or [illegible] have the complete cycles, one con- [illegible] e other, as it were, spasmodical or [illegible] by caprice of will. In involuntary [illegible] xists a constant cycle, as in the case [illegible] are two. There are two mural also [illegible] involuntary muscular motion of [illegible] maintained two cycles, one mural [illegible] the above cited instances there are [illegible] and cycles of something moved, each [illegible] perfect in themselves. All these [illegible] mural in either case.

[illegible] esses there has been a loss of energy [illegible] the energy so spent has been devel- [illegible] all parts of the organism, every in- [illegible] ing its equivalent. As circulatory [illegible] are constant there is a constant ex- [illegible] o called vital force, which has to be [illegible] y oxidation of all tissues and rebuild- [illegible] rotoplasm being periodically intro- [illegible] ion and relaxation serves to exhaust [illegible] rgy. It is well known that all ener- [illegible] s are supplied from two sources, the [illegible] xygen of the air meeting in the blood [illegible] tissues. Let us inquire into a para- [illegible] here organic life alone and that of a [illegible] he vegetable more than the animal. [illegible] ut off and the life of the part even [illegible] circulation, which is simply a me- [illegible] on through the paralized part by [illegible] alone, and barely enough of life and

nutrition to prevent mortification. Here again the part assimilates that of a cold blooded animal subject to changes of temperature from outside media to a certain degree, and the blood circulated in the part being constantly cooled by radiation of heat in passing through the limb, has a cooling depressing effect on the whole system. In this case nerve force or energy is cut off from the limb by some obstruction in nerve track, by which the will has no power to send or force beyond; this may be partial or complete.

Let us now examine into the nature of spasms. In such cases we find too much nerve or contractile energy let loose into the muscle which exerts a power on the contractile fibres much greater than normal, so much so that the muscle remains indefinitely contracted from some unknown cause, so much so that the will has no control, either in turning on or off this muscular force or even controlling it when on. This cramping or spasm of muscles is entirely independent of will, it being the same force that is sent by the will under ordinary circumstances. We may suppose that the irritating cause, whatever it may be or wherever located discharges all the will force that has been held in reserve by the will in a passive state. This spasm or cramp is a very exhaustive process, much more so than the will even after long and continued exertion in the most laborious manner. Over exertion of muscles sometimes causes cramps in them, whether from actual stunning of fibres, or over nutrition of the muscle serving to clog, thereby irritating. Irritation at one point may be transferred to distant muscles. In all these cases we have interrupted cycles abnormal, the demand being greater than the supply of systematic energy, hence prostration if long continued.

Sanctiviti or St Vitus's Dance is another form of nervous disorder when the muscles of volition are under the control of some disturbing cause in the nerves, or perhaps the muscles themselves may be involved, acting partly independent of the will and partly under its control, resulting in indefinite volition and mixed or indefinite cycle in such cases.

...e named. Such cases have pathological
...al conditions also apply to involuntary
...ough not so frequent.
...een said and arguments advanced in my
... becomes evident that all vital energies
...efly expended on muscular motion and
...ulation and respiration which has to be
...y without interruption so long as life
...n object of this muscular involuntary
... to carry into the organism ternary and
...ogether with oxygen, and carry out, in
...s of dissimilation or mineral elements.
... all the above named processes seems to
...r oxidation on the one hand and to fur-
... building material for the waste of cell
...c compounds and oxygen enter the or-
...l elements leave it, hence animals, espec-
...order, do not subsist on mineral elements
...be so readily oxidizable, as organic com-
...e minerals would serve the purpose of
...ght take the place of the ternary group.
... elements of man and the higher animals
...r from the mineral kingdom in the form
...the binarys meet, are decomposed by the
... elements, from hence man is first plant
...ox or sheep, then mineral in turn. Thus
...g place in every part of the organism at
...d when normal quantities and qualities
...pplied, as constantly reproduced, other-
...d general death follows. Thus we see
...re removed from the wheels of life, and
...ced by new ones, the joints, perhaps, less
...e of spoke, and life goes on taking down

...mpt to argue the question whether the
...the mind, or whether the mind is a factor
... We may presume that mind is made up

of cycles, as well as all motions in the cosmas organic and vital existence, forming two parts of the cosmas, hence animal motions form no exception to the general rule, even oxidation in the cells need not form an exception.

Life force then is a constant antagonism to the inorganic surroundings, the physical portion of the cosmas, and a constant struggle to a return to the primitive condition, or inorganic, where all life elements are in less complex combinations, or the binary condition. As no force is capable of self subordination the binary groups before metamorphosis, must be overcome by some new and more powerful energy.

This new energy may be supposed to be the organic breaking up of old and forming new and more complex with stronger affinities. Now, before the new affinities can in turn be overcome, energies still stronger than those that first overcame the binarys, must be brought to bear, and if brought about by the same forces these same forces must be removed and act in an opposite direction and with greater energy than in the first instance, resulting in resolution of elements. In other words no force or power can, without extrinsic interference, overcome or overturn itself. One great disturbing cause existing between the animal organism and the surrounding media, is difference in temperature, and the energetic struggle on the part of the organism to retain an elevated temperature some degrees higher with constant variations of the surrounding media, and the tendency to bring all bodies so influenced to its own temperature by natural interchanges of heat. Cold blooded animals cannot resist these outside influences to the same extent as the warm, owing to their slow oxidation and nutrition, thereby offering feebler resistance. When the temperature of the media reaches that of warm blooded animals, such animals are in greater danger of suffocation, from the fact that oxidation now becomes retarded to a certain extent and the antagonistics assuming more neutral relations, the consequence less disturbance. When the temperature rises above that of the animal body, the animal is then even in less dan-

...n the body with cooling drinks when ...nes equal is advantageous, unless car- ...difference is preferable to sameness of ...ntagonisms are greater, and life cannot ...hem.

...e is brought to bear on the fibre, or ...uscle is acted upon, whether the whole ...n rapid succession, cannot be readily ... be first spent in the centre of the ... in all directions, or it may be spent ...ot known. It may invade the muscle ...nts, at once entering and traversing ...circles How it enters or how it acts ...etermined, though one fact seems to ...at is, that there is a development of ...n in the muscle itself caused by the ...ve muscular force. Or the mechanism ... may be such that a small force may ...r on mechanical principles. A slight ...uts into motion a train of energies, the ...hich are wholly disproportionate to the ...The comparison is at least justifiable. ... and knowledge before us we are ...he conclusion that the whole object of ...on and that all the energies of the ...economically bottled up in reserve for ...bs or flies the trigger that puts the ...on. All these forces may be summed ...d that activity oxidation versus nutri- ... be supposed to be a separate life point ... the whole organism, having its own ...ough dependent on and subservient to ...mutually dependent, not one of which ...greatly disturbed without reacting on ...n and reaction being the order of life. ... not oxidized, are cast off bodily from ...ody, and as constantly rebuilt bodily

from the surface of the membrane basement or basement membrane by fissipuration or fissuration direct from the protoplasm. This species of cells being then bodily thrown off or shed, and as constantly replaced, not by slow disintegration, by the action of oxygen and rebuilt by integration of molecules as is the case with all other cells. Was it not for this constant desquamation of the skin, nerves and serous surfaces there would be an indefinite development going on outwardly from these surfaces that would be without limitation, and shapeless masses of flesh would be the result. But it has been otherwise ordered and certain definite limits fixed for the well being of the animal.

To be Continued.

ARTICLE II.

Anæsthetics for Dental Operations.

Ether, Chloroform and Nitrous Oxide.

By Walter Bruce, D.D.S.

The agents commonly used to produce anæsthesia are ether, chloroform and nitrous oxide, the latter being particularly interesting to us as dental surgeons, since so far as its merits up to this time have been tested it answers the purposes of a dental anæsthetic better than any other that has yet come into the possession of the profession. There are other *local* anæsthetics, the best of which are ether spray and rhigoline spray, which may be sometimes advantageously used in cases where general anæsthetics are contra-indicated, and where it is desirable more to overcome the reluctance of the patient than to produce any decided anæsthetic effect. The honor of the discovery of anæsthesia or of producing insensibility to pain during surgical operations by means of certain agents, is properly due to American dentists. Dr. Horace Wells. of Hartford, Connecticut, induced anæsthesia with nitrous oxide in 1844, and Dr. Morton, of Boston, Massachusetts, discovered the anæsthetic property of ether. He performed the first painless operation (extraction of a

[illegible] ...y the anæsthetic property of ether on [illegible] ...er, 1846. During the following month [illegible] ...e operations were performed with ether [illegible] ... a tumor on a man's face, and the other [illegible] ... tumor on the arm of a female. These [illegible] ...rmed by Drs. Warren and Heywood, [illegible] ... General Hospital. In the first opera- [illegible] ... was not complete, it being difficult to [illegible] ... whilst operating on the face ; in the [illegible] ...he 7th of November, at the same Hos- [illegible] ...ministered ether to a female upon whom [illegible] ...peration of amputation at lower third [illegible] ...knee joint. In this case the anæsthesia [illegible] ...eration having been performed without [illegible] ...at the time on the part of the patient [illegible] ... of ether by inhalation had been long [illegible] ...h very beneficial results by some physi- [illegible] ...ant. More than a century ago, Dr. Pear- [illegible] ... in the habit of administering as an ex- [illegible] ... tincture of cicuta leaves, with which [illegible] ...lly produced anæsthesia. It is also [illegible] ...t the celebrated John Baptista Porta, [illegible] ...agic, produced his anæsthetic effects or [illegible] ...ns of ether inhalation. A good many [illegible] ...rly part of this century, the boys in a [illegible] ...adelphia, known as Northern Liberties, [illegible] ...erely for sport, of inhaling ether. The [illegible] ...from a slight exhilaration to profound [illegible] ...m meningitis having occurred as a con- [illegible] ..., the municipal authorities put a stop [illegible] ... other cases of insensibility produced [illegible] ...ed in different medical journals. But, [illegible] ...s hinted at, and near being discovered [illegible] ...s at different times, it has remained for [illegible] ...n and a member of the young profes- [illegible] ...monstrate its practicability and applica- [illegible] ...e medical profession has long been ac-

quainted with a liquid possessing the properties of sulphuric ether. The name ether—spiritus ethereus—was first given to it by a German chemist named Froben, who lived in the early part of the eighteenth century. Ether is the oxide of a compound radicle called ethyle. Its formula is C_4H_5O, and differs from alcohol only by the proportions of water; alcohol being composed of $C_4H_6O_2$. It is one of the products of the destructive distillation of sulphovinic acid, or, what is equivalent, equal weights of strong alcohol and oil of vitriol. Sulphovinic acid is the bisulphovinate of ether, its formula being $C_4H_5O2SO_3HO$. By means of the heat applied in distilling, the ether (C_4H_5O) is liberated, passes over and is condensed in the receiver. In order to purify it, it is mixed with caustic potassa and gently redistilled. A proper regulation of the amount of heat, and other precautions are necessary in conducting the distillation and purification. Ether is a clear, colorless, transparent, thin liquid, of a peculiar penetrating odor, at first, to many persons not unpleasant, and of a hot, pungent taste, followed by a sensation of coolness in the mouth. According to the United States Pharmacopoeia it has a specific gravity of 0, 750, and boils at a temperature of 96° Fahrenheit under ordinary atmospheric pressure. When dropped on the hand it leaves a sensation of coolness, caused by the rapid evaporation. It is very volatile and highly inflammable. When pure and recently prepared it is neutral, but when exposed to the atmosphere and light, it absorbs oxygen and becomes acid by the production of acetic acid and water. It is miscible with alcohol in all proportions, but one part of ether requires ten parts of water to dissolve it. It dissolves volatile oils and some of the fatty and resinous substances. Taken internally in the liquid form, it is a diffusable excitant; is also excitant if inhaled in moderate quantity. In large doses it acts like alcohol somewhat, producing intoxication; in still larger doses narcosis. It can be detected, like alcohol, in the pulmonary exhalations, and the brain of those who have died after it has been largely exhibited. The impurities to

[illegible] are acids, water, alcohol and heavy [illegible]ls may be detected by litmus paper. [illegible] a very good way is to agitate in a [illegible]tity of ether with half its volume of [illegible]f chloride of calcium. The chloride [illegible]e water in the ether, and the dimin- [illegible] the graduate measure will show the [illegible] was present in the ether. Alcohol [illegible] it be present in very large amount, [illegible] the suspected ether with water; the [illegible]her and uniting with the water, two [illegible]d being formed. If this be done in [illegible]e amount of alcohol present can be [illegible]nce of heavy oil of wine is shown by [illegible]ilky when dropped in water. Any [illegible]ances held in solution can be detected [illegible]tion of the ether. Ether to be pure [illegible]e or odor when evaporated on the palm [illegible] test for the purity of any article of [illegible]cific gravity, all other articles with [illegible]lterated having a tendency to increase [illegible]ted States Dispensatory says, that a [illegible]r is admissable in officinal ether, but [illegible]s it should always be as pure as possible.

[illegible] noticed for the production of anæsthe- [illegible] to a great extent superseded ether, is [illegible]iscovered in the year 1831 simulta- [illegible]thrie, of New York and Soubeiran, [illegible]ars afterwards, Dumas determined its [illegible]n and gave it the name of chloroform. [illegible]ble stimulant in medical practice, and [illegible] substitute for alcoholic liquors. Dr. [illegible] under the head of narcotics, and ac- [illegible]orne a fluid drachm of chloroform is [illegible]ect to thirty or thirty-five drops of [illegible]hetic property was discovered by Prof. [illegible], in 1846. Prof. Simpson had been

experimenting for some time with anæsthetic agents in order to discover a better one than ether. His attention was called to chloroform for that purpose, by a gentleman in Liverpool, and upon trial it proved a success. Shortly after this discovery it was put to public test by anæsthetizing with with it a patient, upon whom Dr. Miller, Professor of Surgery, operated for necrosis of radius. After this its fame and use soon spread throughout Europe, but has not yet entirely supplanted the use of ether in this country. Leibig calls chloroform a perchloride of formyl. Formyl is a compound radicle composed of C_2H_1. Chloroform may be expressed $C_2H_1Cl_3$. If, by any means, the three parts of chlorine be exchanged for three parts of oxygen the chloroform becomes converted into formic acid. Chloroform is manufactured on a large scale by carefully distilling together good commercial chloride of lime, alcohol and water. The following is Dumas' formula: Chloride of lime in powder, 4 pounds, water 12 pounds, rectified spirits 12 fluid ounces. This is to be distilled and purified according to specific directions. Chloroform is a clear, colorless, limpid fluid, with a bland, ethereal, fragrant, fruit like odor. Its taste is at first sweetish, afterwards becoming hot and pungent. It is easily dissolved in alcohol or ether, but very sparingly soluble in water; according to some authorities requiring 288 times its bulk of water to dissolve it; it dissolves wax, resin, gutta percha, caoutchouc, camphor and other substances; it is inflammable; its vapor, however, burns with a greenish, smoky flame, and it renders the flame of an alcohol lamp yellow and fuliginous. It evaporates easily, though not so easily as ether. The elevation of the temperature greatly increases its vaporization. It boils at 141° Fahrenheit, and has a specific gravity of 1.49 according to the U. S. Pharmacopoeia. When pure it has no action on potassium, but an alcoholic solution of caustic potassa decomposes it, producing chloride of potassium and formate of potassa. According to Dr. Dunglison, a pure article applied locally does not irritate the skin, but alcohol renders it caustic. Accord-

[illegible] has, when applied locally, considerable
[illegible]ffect and also anodyne. When rubbed on
[illegible] hands it quickly evaporates leaving scarce-
[illegible]loroform is liable to contain alcohol, ether,
[illegible] pyrogenous oils. The admixture of ether
[illegible]t moment, a mixture of this sort called
[illegible]g frequently used, and by some preferred,
[illegible]sthesia, but the admixture of alcohol with
[illegible]kes it vesicant to the skin and irritating
[illegible]mbrane of the air passages. Both alcohol
[illegible] the specific gravity of chloroform, and
[illegible]nends, in order to detect the presence of
[illegible] have this effect, to add a drop of the sus-
[illegible]ual parts of concentrated sulphuric acid
[illegible]ic gravity of such a liquid, when cold, is
[illegible]rm being of greater density will sink in it.
[illegible]oposed the following for the presence of
[illegible]rop of the chloroform to distilled water,
[illegible]k to the bottom of the glass and remain
[illegible], but if the slightest quantity of alcohol be
[illegible]les assume a milky appearance. Of all the
[illegible]er, to which chloroform is liable, the most
[illegible] pyrogenous oils. When inhaled, or some-
[illegible], they produce distressing headache and
[illegible] for these oils is pure concentrated sulphuric
[illegible]oform mixed with an equal volume of this
[illegible]r it, but if any of these oils be present the
[illegible] yellow to redish brown, according to the
[illegible]ties. If chloroform containing these oils
[illegible]aporate on the hand, they will remain and
[illegible]ed by their their peculiar offensive smell.
[illegible] evaporates on white paper without leaving
[illegible]thesia is produced with ether and chloro-
[illegible]lation of their vapors. They affect the
[illegible]very similarly and are administered in the
[illegible]ther is said to be less dangerous than chlo-
[illegible] being more transient, and the after effects

not so prolonged, owing probably to its being more quickly volatized and more easily eliminated from the system. Some think that the different chemical constituency of chloroform account for its greater potency and more decided toxical effect upon the system. Whatever may be the cause of the difference between the two agents, certainly more deaths have taken place under the use of chloroform than under ether. The former is more generally used and being a more potent article is more apt to be attended with fatal consequences in the hands of those who do not thoroughly understand its administration. A number of experiments on animals have been made by different men of science with these agents. There is some discrepancy on some points in regard to their results but in the main they coincide. If ether be administered to an animal—rabbit—it manifests, at first, feelings of distress, tries to escape; these phenomena are soon succeeded by a condition of excitement, increased action of the heart and arteries, excited condition of the nervous centres and quickened respiration; a stage of depression now commences, lessening of the frequency of the action of the heart, and of respiration, impairment of muscular action; the animal staggers, falls upon its side, the sphinctors relax, attended sometimes with voiding of the urine and fœces, complete insensibility and muscular relaxation. If air be now admitted the animal soon revives, but if the administration of the vapor be continued, the pulsations and breathings rapidly diminish, there are symptoms of cerebral congestion, cold extremities, lividity of the lips. We have the symptoms of complete coma and finally cessation of the action of the respiratory organs and of the heart. According to the investigations of M. Flourens and others the nervous centres appear to be brought under the influence of these anæsthetics in the following order: First the cerebrum, the seat of the intellectual faculties, next the cerebellum, the seat of the power of co-ordinating muscular movements, then the spinal cord with its reflex or sensori-motor functions, and lastly, if the agents be pushed far enough, the medulla oblongata or

...t," resulting in a cessation of, or rather as a
...uence of this, stopping of the respiration
... vapor of ether or chloroform then, admin
...in extent, produces insensibility attended
...plete or incomplete loss of consciousness
...ugh beyond this extent, death is the result
... takes place before loss of motion. If during
...n of the vapor it be diluted by admixture
...ptoms can be more gradually produced and
...eater length of time. During the inhala
...lood becomes dark, and according to some
...ibility is produced before any dark blood
...in the arteries. Upon the withdrawal o
...d the admission of air to the lungs, the
...umes its brighter normal hue. In blood
...aesthetized person the amount of the fibrine
...e clot is more condensed, whilst there is an
...mount of the serum. The blood of horses
...gents had been administered, retained the
... several days afterwards, and a goat retained
... in its milk for five days. Dogs have been
...ction even when the agents had been given
... to breathe. The amount of fat in the
...shed by the administration of these agents
...n Bibra, and increased in the liver. I
...d during the first stage of the anæsthesia
...nd very much congested, in the second
...quently found emphysematous. If either
...e taken into the stomach in the liquid form
...cation; and chloroform in large doses, an
...most always results in death, the autopsies
...ation of the stomach, sometimes attended
...ondition of the mucous membrane of the
... passages, and congestion of the brain. The
... Pirogoff, has shown by experiments on
...e vapor of ether or chloroform be injected
...r if the liquid be slowly injected the same

anæsthetic effect is produced as by inhalation. Ether and chloroform are both administered in the same manner. A number of inhaling bottles and apparatuses have been invented for the more easy introduction of the vapor. The simplest and best means for this purpose is a napkin or towel folded into a funnel shape around the hand, and the ether or chloroform dropped into the bottom of this, or else a cone shaped piece of tin or paste-board, in the bottom or apex of which is a sponge on which the agent is poured. Some prefer a handkerchief moistened with the anæsthetic fluid applied to the mouth and nostrils. Others again prefer simply a single layer of cotton cloth laid over the mouth and nose on which the agent is gradually dropped. This latter is Prof. Simpson's method. The patient to be anæsthetized is placed in the recumbent posture, the "decubitus dorsalis," on a couch, the head slighly raised by a pillow, and, if the weather will permit, the patient should be in the open air, or else in a large airy room where the windows can be raised and currents of fresh air freely admitted, should it become necessary. All parts of the dress should be loosened, so as to permit free play of the diaphragm and other muscles of respiration, and allow unimpeded circulation of the blood. If the patient be feeble or timid it would be advisable to precede the inhalation with brandy or brandy and laudanum. The administration of brandy before inhalation was considered always safe practice by the Confederate Surgeons during the war, and was rarely ever omitted when the article was to be had. The mouth and nose should now be anointed with glycerine or oil to prevent any vesicating effect of the chloroform, if that be the agent administered, and a few words of comfort and assurance addressed to the patient. The folded napkin with the ether or chloroform in it, is brought near the face. It should be made to approach gradually for fear of producing too great suffocating effect, and should not be allowed to come nearer than one inch of the face, so as to allow admixture of air with the vapor. By observing these precautions the anæsthesia is produced

and with less risk to the patient, enabling e successive changes as they occur, and at administration comprehend the condition Silence should be enjoined upon the by cases where we are doubtful of the propri ing, and indeed in all cases, it would no at hand the means for effecting resuscita t should not be raised during the inhaling fear of producing syncope. Considerable s required in the administration. The dition of the patient is to guide us in re nt of vapor required and its adjustment o The first effect of the inhalation upon th rease vascular action, the pulse become t beats with more frequency and the blood ter force to the surface. The face is slightly tenance assumes a more lively expression uicken and the skin grows moist and warm

To be Continued.

ARTICLE III

The Fifth Pair of Nerves.

ILLIAM S. CARRUTHERS, D.D.S.

practitioner an anatomical, physiologica knowledge of the Trifacial is highly inte essential, to an intelligent performance o ny of its painful affections are traceable t of the teeth, supplying, as it does, thes e filaments from the maxillary divisions. considered, we find the fifth nerve peculia mpound and special, supplying parts wit on, with filaments of sensation, and throug nch with filaments pertaining to the sens he great sensitive nerve of the head and fac peripheral expanse, and having its centr dulla oblongata, one of the most comple

of nerve centres, explains the difficulty of diagnosing many of its affections.

The three divisions coming from the ganglion of Gasser are sensitive, the Opthalmic with its divisions, the frontal, lachrymal, and nasal branches, is distributed over the frontal orbito region, and their ramifications supply with filaments the muscles of the eyelid and forehead, integument of the forehead and nose, the tentorium, lachrymal gland, the pericranium of frontal, and parietal regions and ciliary muscle and iris. The supra-orbital branch of the frontal anastomoses with filaments of the facial nerve, and supplies the integument as far back as the occiput.

The second division of the Sup. Maxillary has the same origin, it is sensitive, and although smaller than the third division has a great range of distribution, associating with the facial nerve and supplying with sensor filaments, Meckel's ganglion. Its branches of distribution are, three from the spheno-maxillary fossa, the orbital, ganglionic and posterior dental, one from the infra orbital canal, and three on the face. The distribution and ramifications of this division are easily seen by the markings on the bones of the face, the orbital branch from the orbital cavity dividing into two branches the temporal and malar. The temporal passes through the foramen in the malar-bone, enters the temporal fossa, and, associating with the facial and inferior maxillary, is distributed to the integument on the side of the head. The malar branch, also leaving the orbit through the foramen in the malar bone, perforates the orbicularis palpebrarum muscle, associating likewise with the facial nerve. The posterior dental dividing into two branches, the anterior and posterior, the latter entering the sup. maxillary bone above the tuberosity, forms a plexus and distributes filaments to the posterior teeth, the anterior supplying the gums and buccinator muscle, and their terminations lost in union with the other branch. The anterior dental branch we find coming from the infra-orbital canal, about midway entering another canal situated on the face of the maxillary sinus, this branch

[illegible] rior incisors, canines and bicuspid teeth. [illegible] tal foramen we have the palpebral, labial [illegible] supplying the obicularis palpebrarum [illegible] tegument and conjunctiva of the lower [illegible] ing at the outer angle of the orbit with [illegible] f the orbital, and filaments of the facial [illegible] ments supplying the muscles and integ- [illegible] and this region, and the labial filaments [illegible] uscles and integument of the upper lip. [illegible] xillary nerve is the largest of the three [illegible] ompound, being sensor and motor, the [illegible] the ganglia and uniting with the motor [illegible] There are two branches of this division, [illegible] ior, the anterior by five divisions supplies [illegible] e, the deep surface of temporal and the [illegible] integument and mucous membrane. The [illegible] he larger of the two divisions, is sub- [illegible] branches, the inferior dental, the lingual [illegible] oral, and supplies the inferior teeth, the [illegible] -temporal region. The lingual is the nerve [illegible] d is distributed to the anterior two-thirds [illegible] erminal filament to the papillæ, the fila- [illegible] n, the posterior being supplied from the [illegible]

[illegible] tal branch is the largest of the three divi- [illegible] ing a branch to the mylo-hyoid and to the [illegible] e digastric, it enters the posterior foramen [illegible] and passing beneath the teeth, gives in [illegible] to these organs, terminating in the mental [illegible] rges from the canal at the mental foramen [illegible] ments to the muscles and skin of the in- [illegible]

[illegible] he fifth nerve has been determined from [illegible] ts, and from the analogy it bears to the [illegible] by tracing each of its three great divisions [illegible] its function by its constitution, according [illegible] bres from either root, or from both, and

the distribution of these divisions confirm the views of its physiology suggested by the anatomy of its origin. Division of the opthalmic, or of the superior maxillary, causes loss of sensibility without muscular paralysis, but with the incision of the inferior maxillary then the power of mastication is destroyed and the sensibility of the lower part of the face and tongue. The fifth nerve may therefore be regarded as the motor nerve of mastication, and the sensitive nerve to all of the surface external and internal which belongs to the face and anterior part of the cranium.

We have thus arrived at a correct knowledge of the anatomical and physiological connection and the results of physical changes, yet there are many painful affections which constantly embarras us, that may be traced to the derangement of the teeth (these organs being more subject to disease and abnormal conditions, and cause as much constitutional irritation as any other organs of the various systems of the animal economy), and which have been considered by the medical profession (who generally know very little of dental pathology) as neuralgic, rheumatic, idiopathic, &c. To dental students the honor is reserved of elucidating them, as was reserved the honor of introducing anæsthetics for surgical operations, and thus further illustrating the advantage and necessity of a knowledge of the various branches (as taught in our Dental Colleges) to the dental art.

Many of the painful affections of this nerve are due to reflex action, and it is interesting to us, as being the great channel of reflex impressions between various important nerves already mentioned, and with which it possesses intimate relations, or rather connections, either at its central origin in its courses, or at its peripheral termination. And the sensory division with the motor root is perhaps one of the most important connections in a practical view with facial neuralgic affections.

It not unfrequently happens that parts remote become the seat of pain from the exposure of the nerve of a tooth, as amaurosis and deafness. Dr. Tilbnry Fox records a case of

by the removal of some decayed teeth. of children, whether primary or sec- more or less affected, and the irritation pressure of the teeth, often bring about and spinal cord being affected. The disorders of subsequent years may be the period referred to. We might also disorders produced by the influence of cutaneous eruption to lockjaw. In facial when this nerve, together with the facial, disease, it is capable of producing the physical suffering of any of the nerves through its normal healthy condition cations of the will, the imaginations of necessities and luxuries of life are en- her hand disease will produce equally its healthy condition is conducive to

RESPONDENCE.

ARTICLE V.

In Toe-Toe.

Journal's toe is worse—that is, it (the toe) "whines louder," (Louder than nd we have still stronger evidence that or is our old schoolmate Charlie * * ame." * * * When a new scholar Charlie alway maintained that *he* came on *his* toe, especially if *he* had shoes en we laughed at him he thought each conceal *his* vexation' because *we* had he *hadn't!*"

cimen taken from the first eight lines of that facetious, sarcastic, funny, dogmat-

ical, rhetorical, *grammatical* editor of the the *Register*, and is a fair sample of the remaining portion of the article.

This Editor is a perfect Achilles; and like that irascible hero has *one* vulnerable point. But this is even more sensitive than Achilles' *heel* or Charlie's *toe.* "Bad grammar" is the most effective weapon, if you would vanquish this almost invulnerable editor. As Ithurial's spear was to Satan, so is "bad grammar" to this captious editor of the *Register*, only more so. Hurl this formidable weapon at him and he is overpowered to such a degree that you might "brain him with his lady's fan."

So keen are his grammatical perceptions, that the slightest deviation from the strict rules of Murray is instantly detected, and the article containing it condemned and *tortured.*

For example:—A few months since one of the professors of Rush Medical College, delivered an address at a meeting of the officers or corporators of the Chicago Dental College, which his friends thought would interest the profession at large. They procured a copy which was sent to the editors of the *Register* for publication. But, no matter what the merits of the address were, or how much of value to the profession it might contain; the critical editor applies his grammatical touch-stone, when lo! By this infalible test he discovers "bad grammar." The address is refused and abused. No bad grammar must be found in the columns of the *Register!*—at least no one shall soil our sheets but ourselves.

Now, although we may not have the same antipathy to bad grammar that W. *seems* to have, nor that aversion to being "scolded in bad grammar by a *professor*" that W.'s boy had; still we dont like it in *toe-toe;* nor yet as *thick* as we find it in W.'s spicy article under that witty heading, and we hope—and will kindly suggest, that in future he will "draw it mild."

———

TED ARTICLES.

ARTICLE V.

Reparative Surgery; Case of Destruc-
alf of both Upper and Lower Lips,
outh, with Closure of Jaws by Cicatri-
struction of Mouth by a Succession of
and Subsequent Relief of the Lower
peration.

K, M. D., Surgeon to New York
and St. Luke's Hospital.

ith three wood-cuts.)

d four months old, of German parent-
lliamsburg, Long Island, of fair com-
r, was admitted into St. Luke's Hospital

f parts in this case appears, from the
to have been caused by cancrum oris
gress of typhoid fever, whether follow-
on of mercury cannot be satisfactorily

.—One-half of the upper and two-fifths
h the angle of the mouth, on the right
g the subjacent teeth and gum surface
ent cicatrized margin of the cheek is
adherent to the upper and lower jaws,
er and preventing their separation from
ning mucous membrane of the right
d, the free space between the teeth and
The remaining portions of the lips, on
nken in their vertical dimensions, leav-
ered. The vermilion border of the
s below the septum nasi, while that of
nates below the right inferior canine
somewhat everted at their termination.

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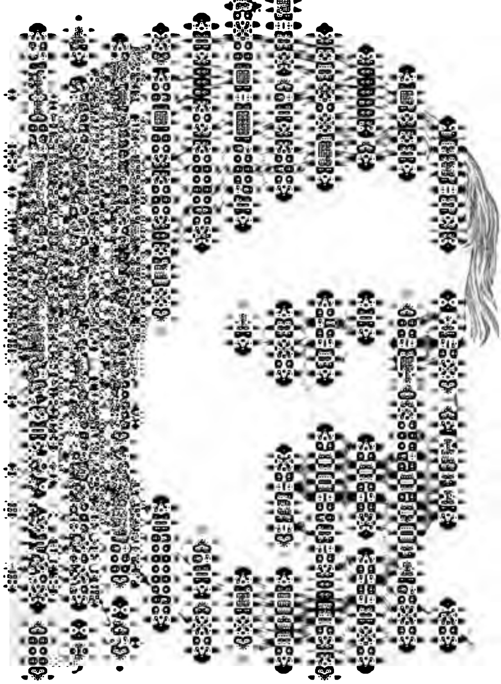
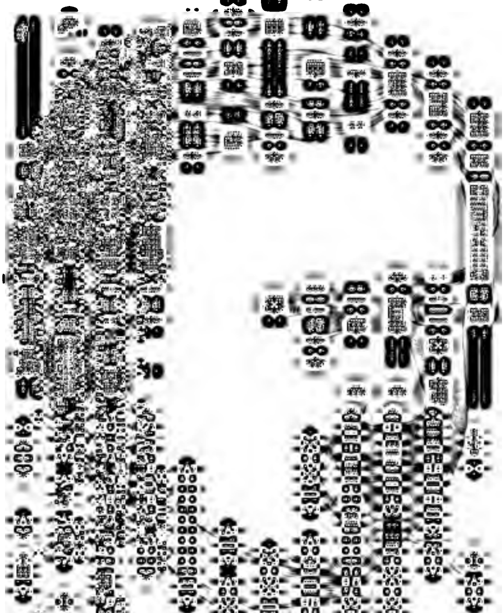


The newly constructed mouth, as shown by Figure, 2 is small in size, and situated mostly to the right of the median line, the left angle being on a line below the orifice of the left nostril.

SECOND OPERATION.—*September* 26. Patient being in excellent condition of health, a second operation was undertaken, for the purpose of increasing the size of the mouth, and rendering it more symmetrical by extending it at the left angle. An incision was made along the line of the vermilion border circumscribing the left angle of the mouth and involving both lips to the extent of about five-eighths of an inch. A double-edged knife was then inserted flatwise at the angle between the mucqus membrane and skin, so as to detach them from each other in the direction in which the enlargement was to be made. The skin alone was first divided with strong scissors, on a line continuous with the commissure of the mouth, to the extent of three-fourths of an inch. The mucous membrane was then divided in the same direction, but to a less extent. A suture was then inserted at the angles of these two incisions to secure them in accurate adjustment. The newly-cut edges of skin and mucous membrane were next pared and matched to each other above and below, and brought into exact coaptation with fine interrupted sutures inserted close to each other. On the second day following the operation the alternate sutures were removed, and on the fourth day all the remaining sutures. The result of this operation was a more symmetrically-shaped mouth, though still too diminutive in size, its length scarcely exceeding one inch and a half.

THIRD OPERATION.—In the month of May, 1867, patient was readmitted into St. Luke's Hospital, and a third operation performed, in all respects similar to the second just described, for the purpose of lengthening the mouth still further in the direction of the left angle. The result was very satisfactory in rendering the mouth more symmetrical and improving the expression of the face. (See Fig. 3.)



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being good, and the parts involved in the previous operations being supple and in excellent condition, it was considered a favorable moment for the operation in question and it was accordingly performed on the first of July, 1867.

Fourth Operation.—An incision was made along the lower edge of the under jaw, from near the angle to within an inch of the symphysis down to the periosteum. The outer and inner surfaces of the jaw being denuded to the same extent, the bone was perforated by a drill of the size of a small quill, on a line below the first bicuspid tooth, to facilitate the section of the bone, which was completed with strong-cutting bone forceps. The same procedure was applied posteriorly, on a line below the second small molar tooth. The included fragment was removed.

Special care was taken to avoid wounding the facial artery by drawing it out of the way posteriorly. The only vessel requiring a ligature was the submental branch at the anterior angle of the wound. A mass of callous cicatricial tissue, in which the teeth of the upper jaw were imbedded, was pared away with blunt-pointed scissors. The newly divided ends of the jaw were gnawed smooth with Luer's rongeur forceps. The removed fragments measured one and a half inch in length. The anterior fragment of the jaw remaining in situ contained, in addition to the teeth belonging to the left half of the jaw, the incisors and canine of the right half, and could be separated from the upper jaw so as to admit a finger edgewise between the back teeth on the left side. This fragment also enjoyed the action of all the depressor muscles of the jaw which had not been disturbed at their insertions near the symphysis by the operation. A tent of lint of the thickness of the little finger was inserted with one end passing out at the right angle of the mouth, and the other through the wound below the jaw. The posterior half of the wound was closed with sutures. The hemorrhage during the operation was inconsiderable, and patient bore it well under the influence of ether. Water

dressings were directed to be kept applied to the face and neck.

July 6.—Inflammatory swelling has been moderate, and is now on the decline. Patient is up and going about.

Nothing in the sequel of this case requires notice except the final result, which was as follows:—

The space left after the removal of a portion of the lower jaw has become obliterated by the approximation of the divided ends of bone, A limited motion of the left half of the jaw exists, and very much facilitates the introduction of food between the teeth. Patient, as well as his parents, appear much gratified with the improvement in his condition, especially the greater facility of feeding himself.—*American Jour. of the Med. Sciences.*

ARTICLE VI.

Gold Foil.

By Dr. G. V. Black.

The first important question to the dentist after having received his gold foil from the beater or dealer is, how can it best be kept in good working order. If it is not kept in good condition, it matters little how or in what form it may be prepared, all operations with it will be faulty.

First, then, in learning how best to preserve the working properties of the gold, it becomes important to study intimately those influences which may be injurious, learn, as far as possible, what they are, how they act, and where they come from; then we may find the proper mode of counteracting them. First, we find that gold possessed of good welding properties gradually loses that important requisite by continued exposure to the ordinary atmosphere. In some cases this may be due to dust collecting upon it in such a manner as to prevent the surfaces from coming into intimate contact, thus preventing a union; but we have abundant proof that there is a far more subtle influence than this, and one far more difficult to counteract, for dust may be excluded with comparative ease.

The fact that gold loses its welding property by exposure to the atmosphere, points us directly to the effects of the gases upon it, especially those that may be found in the air as impurities; for the reason that by close observation we find that the asmospheric effect differs very materially at different times. You all know how common it is to find your gold, which worked well yesterday, work very badly to-day. Why this difference? is a very important question. It will be my effort to point out some of the causes for these differences, and the remedies, as far as I may be able. In prosecuting this enquiry, I have instituted a long series of experiments, in which I find certain gases neutral, others decidedly injurious, while others again seem possessed of a beneficial action.

Among the neutral gases stand all the simple or elementary gases except chlorine, the action of which is remarkable, and will be briefly considered farther on. Among those detrimental, all those gases containing phosphorus or sulphur stand prominent, while ammoniacal gas seems to stand almost alone as beneficial.

Many substances are neutral which might be supposed to be injurious. For instance, gold foil soaked in tincture of iodine, dried, and then annealed, is rather improved than injured, if any difference. The same is true of carbolic acid, ether, chloroform, alcohol, water, and most other substances usually found about the the dentist's case.

The neutral gases need not be considered, but I will notice a few of those decided actions, giving the form of an experiment with each.

Sulphurous acid gas is produced directly from the burning of sulphur in the air, and is composed of one atom of sulphur to two of oxygen; is possessed of decided acid properties, and has the smell of a burning match, and is produced in the dentist's office every time a match is lighted.

Experiment.—A test tube filled with this gas by heating together oxide of manganese and flowers of sulphur, and some ropes of gold foil, part annealed and part soft, intro-

duced. After standing twenty-four hours, it was removed and examined. The soft gold, on being annealed, gave off the gas sufficiently to be very noticeable to the smell, and with a slight crackling sound. The welding property was tried, and although it adhered somewhat, it was easily pulled apart again. The annealed gold was found perfectly soft—would not weld any more than so much tissue paper. On being re-annealed, it gave off the sulphurous fumes, &c., as the soft gold, but there was no restoration of welding property by means of heat. You will notice the difference in the action of this gas on annealed and unannealed gold; and I will state that this distinction was plainly marked in all my experiments with this gas and some of the others.

And when I come to speak more particularly of annealing, I will give some reasons why it should be so.

This gas is a dangerous one to the operator, for it is not only produced from burning matches, but is constantly exhaled from all sorts of rubber goods, with which the dentist's office is generally well stocked now-a-days. It is given off in very appreciable quantities in the trimming and finishing of rubber plates, in vulcanizing, and in all the operations with rubber, and wherever it may be. The truth of these statements is easily tested. For this purpose I placed some litimus paper in a drawer containing the rubber used as coffer dam; in a few days it was completely reddened. Some gold placed in the same drawer was affected similar to that exposed to pure sulphurous acid, though not to so great an extent. In many of our cities the air is often rendered more or less sulphurous by the burning of sulphurous coal, and from other causes the air is often charged with this gas.

It is a somewhat curious fact that sulphur may be wrapped in a rope of gold foil and then burned out without injury to the gold, but this becomes plain when we find that this gas will condense on gold, or affect it only at comparative low temperatures.

Phosphorus experiment.—A bottle was filled with phosphoric acid by burning phosphorus in oxygen gas, and some

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with all doubts, particularly when a similar phenomenon occurs with some other gases. This gas is exhaled in large quantities from all decaying animal substances, and the air generally contains some of it, though the proportion is usually small. But it is clear that it has a tendency to condense upon the gold, and may be collected upon it from the air. And then it may be actually produced in the dentist's office, Blood left in a spittoon over Sunday, or even over night, in warm weather, may exhale enough of this gas to spoil all the gold exposed to its action. It may be exhaled by old teeth, or any animal matter whatever, which may, by any oversight, be left until putrefaction takes place.

The effect produced by burning matches seems to be very irregular, sometimes being that of sulphurous and again that of phosphoric acid, and sometimes different from either. The effect is almost uniformly ruinous on recently annealed gold; but soft gold will sometime weld after being subjected to it and then annealed, and again it refuses to do so, and again it occasionally happens, that amonia fails to effect a restoration. The ruinous effects of the exhalations from the skin are well known to the profession, and need not be dwelt upon in this paper. My experiments confirm the generally received idea that they are always injurious, and further, that if the gold be long exposed to them, the welding property will be entirely destroyed.

Many other gases might be mentioned, but I have discovered no others which are liable to be brought in contact with gold, that exert any decided injurious effect.

Carbolic acid gas softens annealed gold, but the welding property is immediately restored by heat.

Common illuminating gas produces a peculiar spotting of the gold, making it look as if mercury had been sprinkled over it; these spots disappear before a moderate heat, and the gold is apparently uninjured.

Ammonical gas, or its solution in water, is found to be rather beneficial than otherwise, in its action on gold foil. It condenses on and removes the welding property of cohe-

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with a solution of iodide of potassium and starch is first blackened, but afterward shows a variety of colors, among which a very brilliant yellow is conspicuous; a piece of black velvet was changed to a very light brown; a small piece of the same was put into a very small tube, and the gold pressed in against it—after a few hours it was almost a clear white; the same was repeated with the gold and cloth perfectly dry —several days were required to produce the same result. The welding property of the gold was entirely lost, but was completely restored by re-annealing; when heated to redness a copious green flame is given off, which turns red when the heat is intense, presenting a beautiful appearance. When soaked in aqua ammonia, slowly dried, and then annealed, a white sublimate is obtained, which may be collected upon a cold glass held above—a single sheet of gold giving off enough to form a complete crust over a space of two to three inches in circumference; this substance is probably the chlorohydrate of ammonia. When a little water is poured over the gold in a test tube, it takes a yellowish color, almost identical with that of olive oil. I find that on the addition of water, the chlorine instantly attacks the gold and dissolves a portion of it, which it carries into the water, giving rise to this peculiar color; pure chlorine water is almost perfectly clear. Gold subjected to any of the sulphur gases is cleaned, and the welding property restored by subjecting it to chlorine and then annealing; but it fails in case of phosphoric acid.

I had hoped, in the first of my experiments with this gas, that gold treated with it might be employed for the purpose of bleaching discolored teeth; but the fact of its carrying a portion of the gold with it when moisture is present precludes its use, on account of the brownish stain imparted by the gold. I hope this difficulty may be overcome, thus giving us a safe and efficient bleaching agent, which may be used without the least inconvenience to the patient.

Annealing.—The annealing of gold has received considerable attention from the profession, but perhaps not quite as

much as it deserves, considering its great importance. The cdanges effected in gold foil by heat have been differently explained by different persons, and as yet there seems to be no received or fully accepted theory in regard to it. It is true we all know that the direct effect of annealing is to develop the welding property, and if this fails we conclnde that there is something wrong with the gold; it has been thought that heat acted upon the arrangement of the atoms of the metal, producing such a condition that when brought into contact with a similar arrangement, the particles composing the two surfaces would interlock, and be held firmly together. This theory might seem to be supported by the fact that heat applied to large pieces of gold, or to plate, has the effect to fasten them, evidently producing some molecular change—yet that there is another cause for the development of this peculiar property, I think is fully proven by the effects of the gases.

The welding of pure gold foil is prevented by the gases being condensed on its surface, thereby preventing intimate contact; the direct effect of annealing is to drive off such gases, and render the surfaces clean. To prove this, take a rope of gold foil, anneal it in a bath of dry carbonic acid gas for an hour or more; upon trial its cohesiveness is gone; you may put as much force upon it as you like, it will not weld, but is, perhaps, much softer than before annealing; bring this piece again under the influence of the ordinary annealing heat, and the property returns at once and as perfectly as before.

This experiment may be varied by substituting other gases for the carbonic acid, with a like result; some of the gases, however, refuse to be entirely driven off by the ordinary annealing heat, and if we experiment with them, the welding property does not return, as we have seen in the foregoing.

In case of chlorine, the condensation is so great as to perceptibly change the color of the metal, and when expelled by heat the voluminous green flame gives us the idea of a

very considerable condensation. While the gas is on the gold, it is perfectly soft—will not stick together any more than tissue paper, though it might have been in a fine cohesive state only a few minutes before; as soon as the gas is driven off the property returns.

There seems to be a question as to the best heat for annealing. This, in my opinion, will depend entirely on the gas that may have possession of its surface. If it be carbonic acid—which is usually the case—the heat need not be raised quite to redness, for we find that gas to be driven off at a low temperature; if it be sulphuric acid, it should be heated as hot as possible without melting the gold, and kept so for some minutes, and even then it may not be perfectly cleaned. This is very much like the melting point of metals, or the boiling point of liquids—some melt at one point, some at another; some liquids boil at one point, and some at another. It is the same with the gases on gold, some are drawn off at a low temperature, while with some others the metal must actually melt before they leave it.

The gases do not leave the gold instantly at a given temperature, but the first is expelled at a comparatively low heat, and they continue to leave it as the heat rises, until they are completely driven off. This enables us to acquire any degree of adhesiveness we may desire. Some parts of a filling may best be made of non-adhesive gold, while other parts require a perfectly coherent mass. By practice all the gradations of adhesiveness may be attained and used with perfect facility; for this reason the alcohol flame and the annealing of each piece of gold as it may be wanted for use is to be preferred over all other methods.

It has become a custom to say that annealing gold hardens it. This is only true in appearance; the gold is actually softened, just as it is in plate. The gold appears stiffer for the reason that the laminæ of foil stick together whenever they come in contact, instead of sliding easily upon each other as in the case of unannealed gold; this gives the impression of increased hardness, while the facts are just the reverse.

The use of gold rendered adhesive by the beater seems to me to be unadvisable, for the reason that such gold is affected more and easier by deleterious agents in the air than soft gold. In all my experiments there has been a marked difference in intensity and quickness of action of the gases on annealed and unannealed gold ; the recently annealed gold always suffering most. This is explained by the fact that any deleterious gases coming in contact with it finds its surface and its pores, (if they exist,) unoccupied, and consequently no resistance to its action. All plastic golds are affected by the gases to a far greater extent than foils, for the reason that their structure is so much better calculated to absorb and retain them. This needs no further explanation, being palpable to every one; it makes the great difficulty of keeping these forms of gold in good working condition quite clear. I think that if those preparing this form would keep it strongly scented with ammonia, and the dentist do the same, until it is ready to be annealed preparatory to using, this difficulty would be entirely overcome.—*Missouri Dental Journal.* *To be Continued.*

ARTICLE VII.

Physiological Action of the Hydrate of Chloral.

Dr. B. W. Richardson made an extremly interesting report on this subject to the Biological section of the British Association for the advancement of Science, at its recent meeting, from which we make the following extract: The hydrate of chloral, for the introduction of which into medical practice we are indebted to Liebreick (known for his researches on protagon), "is a white crystalline body, soluble in water, and yielding a solution not very disagreeable to the taste. It is made up by the addition of water to the substance chloral. Chloral, the composition of which is C_2HCl_3O, is the final product of the action of dry chlorine on ethylic alcohol. It is an oily fluid, thin, colorless, volatile, The specific gravity is 1.502 at 64° Fahr., and it boils at 202° Fahr. It has a vapor density of 73, taking hydrogen

as unity. The odor is pungent. When chloral is treated with a little water, heat is evolved, and small stellate white crystals are formed as the fluid solidifies. The solid substance is the hydrate of chloral, $C_2HCl_3OH_2O$. The hydrate is slowly volatilized if it be exposed to the air, and the odor of it, were it not pungent, is so like melon as to be hardly distinguishable from melon. When heat is applied to the hydrate it distills over without undergoing decomposition.

"When to a watery solution of hydrate of chloral caustic soda or potassa is added, the hydrate is decomposed, chloroform ($CHCl_3$) is set free, and a formate of sodium or potassium, according to the alkali used, is formed. In was on a knowledge of this decomposition by an alkali that Liebreich was led to test the action of the substance physiologically. He conceived the idea that in the living blood the same change could be effected, and that the chloroform would be liberated so slowly that anæsthesia of a prolonged kind would result. To try this he subjected animals to the action of chloral, and even man, and proved that sleep could be rapidly induced without the second stage of excitement common to the action of chloroform when it is given by inhalation. Liebreich produced in a rabbit, by a dose of 0.5 gramme of the hydrate of chloral, a sleep which lasted nine hours. This dose was equivalent to 0.35 of chloral, and to 0.29 of chloroform. The symptoms, he found, were like those produced by chloroform. In some cases he gave the hydrate to the human subject. The first case was that of a lunatic, to whom he administered 1.35 gramme. No irritation was set up, and five hours of sleep was obtained. In a second case he gave internally a dose of 3.5 grammes to a man suffering from melancholia, by which he produced a sleep of sixteen hours.

"Such," said Dr. Richardson, "was an epitome of the facts placed before him at the time when he commenced to make his experiments. In setting out on his own account, he first prepared a standard solution of the hydrate. He found that 30 grains dissolved in 40 grains of water, and formed a sat-

urated solution, the whole making up exactly the fluidrachm. The standard solution prepared in this way was very convenient.

"He next proceeded to inquire whether, by the addition of hydrate to fresh blood, chloroform was liberated. This was proved to be the fact; the odor of chloroform was very distinct from the blood, and chloroform was itself distilled over from the blood, and condensed by cold into a receiver.

"The narcotic power of the hydrate was then tried on pigeons, rabbits, and frogs. The standard solution named above was employed, and was administered either by the mouth or by hypodermic injection. The action was equally effective by both methods. The general results were confirmatory of Liebreich's own experience to a very considerable extent. They are as follows: In pigeons, weighing from 8½ to 11 ounces, narcotism was produced readily by the administration of from 1½ to 2½ grains of the hydrate. In these animals the dose of 2½ grains was the extreme that could be borne with safety, and a dose of 1½ grain was sufficient to produce sleep and insensibility. The full dose of 2½ grains produced drowsiness in a few minutes, and deep sleep with entire insensibility in twenty minutes. Before going to sleep there was in every case, whether the dose were large or small, vomiting. As the sleep and the insensibility came on, there was in every instance a fall of animal temperature, and even in cases where recovery followed, this decrease was often to the extent of five degrees. The respirations also fell in proportion, declining in one case from 34 to 19 in the minute during the stage of insensibility. From the full dose that could be borne by the pigeon the sleep which followed lasted from three and a half to four hours. Six hours at least was required for perfect recovery. During the first stages of narcotism in pigeons the evolution of chloroform by the breath was most distinctly marked.

"In rabbits weighing from 83 to 88 ounces, thirty grains of the hydrate were required in order to produce deep sleep and insensibility. A small dose caused drowsiness and want

of power in the hinder extremities, but no distinct insensibility.

"When the full effect is produced in rabbits from the administration of the large dose, the drowsiness comes on in a few minutes: it is followed by want of power in the hinder limbs, and in fifteen minutes by deep sleep and complete insensibility. The pupil dilates and becomes irregular; the respiration falls (in one case from 60 to 36 in the minute) and the temperature declines 6° Fahr.; sensibility returns with the rise in number of respiratory movemonts, but in some cases falls again during the process of recovery. The drowsiness, or, if the animal is left alone, what may be called sleep, lasts from five and a half to six hours. But it was observed that the period of actual anæsthesia was very short, lasting not longer than half an hour, after which the skin seemed rather more than naturally sesitive to touch. During recovery there are tremors of muscles almost like the rigors from cold; they are due probably to great failure of animal temperature.

"In frogs a grain of the hydrate causes almost instant insensibility, coma, and death.

"In further prosecution of his research, the author tested on similar subjects, the effect of chloroform, bichloride of methylene, tetrachloride of carbon, and chloride of amyl. In all the observations with these substances, the narcotizing agent was used by hypodermic injection. It was found, as a result of these inquiries, that seven grains of chloroform, five of tetrachloride of carbon, and seven of chloride of amyl, produced the same physiological effect as two grains of the hydrate. Seven grains of bichloride of methylene induced a shorter insensibility. A rabbit subjected to thirty grains of chloroform slept four hours and twenty-five minutes; and a pigeon subjected to seven grains slept three hours and twenty-five minutes. All these agents caused vomiting in birds, before the insensibility was pronounced, the same as did the hydrate; but in no animal was there any sign of the stage of excitement which is seen when the

same agents are administered by inhalation. This fact is most important as indicating the difference of action of the same remedy by difference in the mode of administration.

The temperature of the body was reduced by the agents named above, but not so determinately as by the hydrate.

"Two animals, pigeons, made to go into profound sleep, the one by the hydrate, the other by chloroform (each substance administered subcutaneously), were placed together, and the symptoms were compared. The sleep from the chloroform was calmer; there was freedom from convulsive tremors, which were present in the animal under the hydrate, and recovery was, it was thought, steadier. It was observed, and the fact is well worthy of note, that no irritation was caused in the skin or subjacent parts by the injection of the chloroform and other chlorides.

"The neutralizing action of the hydrate on strychnia was tried, and it was determined that the substance arrests the development of the tetanic action of the poison for a short period, and maintains life a little longer afterwards, but does not avert death. This subject deserves further elucidation.

"When the hydrate of chloral is given in an excessive dose it kills; there are continuance of sleep, convulsion, and a fall of temperature of full eight degrees before death.

"The post mortem appearances were noticed after a poisonous dose. The vessels of the brain are found turgid with blood. The blood is fluid, and coagulation is delayed (in a bird to a period of three minutes), but afterwards a loose coagulum is formed. The color of the brain substance is darkish pink. The muscles generally contain a large quantity of blood, which exudes from them, on incision, freely. This blood coagulates with moderate firmness. Immediately after death all motion of the heart is found to be arrested. The organ is left with blood on both sides, but with more in the right than in the left side. The color of the blood on the two sides is natural, and the coagulation of this blood is moderately firm. The other organs of the body are natural.

"Other observations were made on the changes which the blood undergoes when the hydrate of chloral is added to it. The corpuscles undergo shrinking, and are crenate; and when excess of hydrate is added the blood is decomposed in the same way as when treated with formic acid. The summary of the author's work may be put as follows;—

"Hydrate of chloral, administered by the mouth or by hypodermic injection, produces, as Liebreich states, prolonged sleep.

"The sleep it induces, as Liebreich also shows, is not preceded by the stage of excitement so well known when chloroform is administered by inhalation.

"The narcotic condition is due to the chloroform liberated from the hydrate in the organism, and all the narcotic effects are identical with those caused by chloroform.

"In birds the hydrate produces vomiting in the same manner, and to as full a degree, as does chloroform itself.

"The sleep produced by hydrate of chloral is prolonged and during the sleep there is a period of perfect anæsthesia; but this stage is comparatively of short duration.

"The action of the hydrate is (as Liebreich assumes) first on the volitional centres of the cerebrum; next on the cord; and, lastly, on the heart.

"*Practical applications.*—Whether hydrate of chloral will replace opium and the other narcotics is a point on which the author was not prepared to speak. It is not probable that it will supersede the volatile anæsthetics for the purpose of removing pain during the performance of surgical operations, but it might be employed to obtain and keep up the sleep in cases of painful disease. This research had, however, led to the fact that chloroform, when injected subcutaneously in efficient doses, leads to as perfect and as prolonged a narcotism as the hydrate, with an absence of other symptoms caused by the hydrate, and which are unfavorable to its action. This was a new truth in regard to chloroform, and might place it favorably by the side of the hydrate for hypodermic use. Lastly, as the hydrate acts by causing a

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BIBLIOGRAPHICAL NOTICE.

A Treatise on the Diseases of the Mouth, Jaws and Associate Parts. By James E. Garretson, M. D., D. D. S.,—Publishers, J. B. Lippincott & Co., Philadelphia. This is a volume of seven hundred pages, illustrated by one hundred and twenty wood cuts, and thirteen steel plates, and, as the preface states, embodies the results of the Author's observations and experiences, during a somewhat extended practice in that branch of the profession to which it specially relates.

Chapter I. is devoted to the Surgical Anatomy of the Mouth and Face, and is a clear and well written description of the osseous structure of the skull. The wood cuts illustrating this chapter are well engraved, and we only regret that the style of Gray's Anatomy has not been followed, where instead of numbers, the full name of each part appears upon the part itself without foot notes.

Chapter II. contains a description of the mouth, embracing the muscles, arteries, nerves and veins of the face, sectional expression of the mouth, descriptions of the tongue, mucous membrane, salivary glands and temporo-maxillary articulation.

Chapter III. is devoted to a lengthy and well written description of the Fifth Pair of Nerves, but the arteries supplying the teeth, should, we think, have received the same attention. This, however, is not the case, and from the meager description given in the second chapter, a perfect knowledge of these organs cannot be obtained. The author may, however, reply that this work was not written for an Anatomy, but as he has given us such a complete account of the bones of the face, we were led to expect corresponding ones of the muscles and arteries.

Chapters IV., V. and VI. are upon Dentition, Associate Lesions of First Dentition, and the Anomalies of Second Dentition and their Surgical Relations. These subjects are well defined and illustrated by plates from Forget's description of these anomalies.

Chapter VII. under the general head of the Teeth and their Diseases, treats of Alveolar Abscess, and the Author claims as original the surgical treatment of destroying the sack by drilling through the outer wall of the alveolar cavity with a spear shaped drill, and thus reaching the sack in order to break it up, a method which has been practiced for many years. He very justly, however, denounces the practice of applying blisters and warm fomentations to the face in incipient alveolar abscess, and recommends, where it is not desirable to adopt the surgical method, the application of a roasted fig or raisin directly to the affected part. A number of interesting examples of the anomalies of alveolar abscess, selected from the Author's practice and that of others, are described in this chapter.

Chapter VIII. treats of Trismus. Chapter IX. of Caries, from which a great deal of useful information may be obtained, on the structure and composition of the teeth, and the nature of the food proper in infancy and childhood. This is followed by a brief description of the treatment of caries, with illustrations of the instruments necessary and the materials in use. Also several formulas are recommended for mouth washes and tooth powders.

Chapter X. is devoted to Odontalgia, and the following causes of this affection are named: Sensitive Dentine, Direct or indirect exposure of pulp to sources of irritation, Diseased state of the Periodonteum, Confinement of pus and gas in the pulp cavity, Granules of osteo-dentine in the pulp, Sympathy, Recession and Absorption of the gums and Aveolus.

Chapter XI. describes Salivary Calculus and the method for its removal. Chapter XII. Denudation, the Author asserting that this disease to be one of predisposition, the result of impressions made upon the enamel at the period of its formation, and which predisposition has never by accident or design been corrected. As means of relief from Mechanical Abrasions, he refers to the several methods in use, such as metallic caps on the posterior teeth, and the forming of cavities in the abraded surfaces, which cavities are to be filled with gold so built up as to afford a masticating surface.

Chapters XIII. and XIV. treats of the Extraction of Teeth and the Local Anæsthetics used in this operation, and contains some useful suggestions. Chapters XV. and XVI. are devoted to General Anæsthetics, with a few remarks on Nitrous Oxide Gas, the Author referring the reader to other works for information concerning this agent.

The remaining chapters which compose the greater part of the work, are devoted to Oral Surgery proper, such as Salivary Fistulæ. Affections of the Tonsil Glands, Diseases of the Gums, the significations being accumulation of tartar, periodontitis, the mercurial impressions, scurvy, syphilis, dead or loose teeth, a crowded dental arch, use of improper dentifrices and brushes, improperly inserted artificial teeth, malignant impressions, anomalous conditions; then follow chapters on Caries of the Maxillæ, Necrosis of the Jaws, Tumors of the Mouth, malignant and non-malignant, The Diseases of the Antrum of Highmore, Neuralgia, Wounds of the Mouth and Associate Parts, Ozaena, Fracture of the Maxillary Bones, Dislocation of the Inferior Maxilla, in which Dr. Gunning's splints are described, and brief mention made of Dr. Bean's splint and occipito-frontal bandage, which the Author remarks "is in its character similar in principle to the splint of Dr. Gunning," (an opinion which we think, does not do justice to Dr. Bean), Operations upon the Lips and Cheek, Diseases of the

Tongue, Apthae, Ranula, Palatine Defects and their Treatment, Obturators and Resection of the Maxillary Bones.

College and other duties at this season of the year prevents our giving more than this general review, but we feel satisfied that every dentist will find much that is useful in this work, and that it will be of the greatest service to the dental student. The Publishers deserve credit for the handsome manner in which the work is gotten up, both as regards the text and the engravings with which it is so liberally supplied.

EDITORIAL DEPARTMENT.

Dental Collegiate Education.—The Dental Colleges are again in operation, the Annual Sessions having commenced with infirmary practice and preliminary lectures, about the middle of last month, and the regular lectures on the first day of the present month.

We learn that at most of these institutions the prospects for an increased number of students over last year are very encouraging; and in some of them the standard of qualification has been raised, and every available effort being made to render the degree they confer a true honor and mark of fitness, and not one of disgrace.

Those who are, or have been, engaged in teaching will understand the responsibilities and labor, physical as well as mental, which is attached to a professorship. The dental teacher must search for error as well as for truth, in order that he may tread down the one and embrace the other. All kinds of systems must come under his observation, and nothing be allowed to escape his attention, in order that his understanding may be enlarged and his ability to confer knowledge be increased.

That our Dental Colleges, like the Medical, are not all they should be is an indisputable fact, but the time has come for a liberal reform. There may have been and no doubt was a time when the practical difficulties in the way rendered it impossible to adopt a high and rational system of instruction, and to exact more than a miserably low standard of qualification. But such a time has passed away, and important changes for the better have been adopted in regard to the course and range of study, and the standard of qualification. It is not expected that a student, on receiving the degree of D.D.S. should be an accomplished dentist, perfect in all that pertains to the practice of his profession, but it is expected that when he enters into regular practice, a broad line will exist between himself and the quack. For the benefit of those of our readers who are uninformed in regard to what is taught in Dental Colleges, we give the following

summary of the course pursued in the institution with which we are connected:

The lectures on Pathology and Therapeutics teach the principles of general pathology, also the special pathology, diagnosis, and treatment of those diseases which involve the structures of the mouth and adjacent parts, and the local effect upon these organs of general, constitutional and hereditary disease. All the prominent articles of the materia medica are accurately described, illustrated by specimens and botanical plates, and accompanied by their appropriate therapeutical indications.

The lectures on Dental Science and Mechanism teach the true bearing of scientific culture upon Dental art; its absolute necessity, and the relative importance of the several sciences—the connection between dentistry and general medicine and surgery —and the mechanical, artistic and æsthetic elements of dentistry. which distinguish it from all other branches of the *Ars medendi.* All details of dental mechanism are explained and demonstrated. The tendency to reject older methods for untried novelties guarded against, whilst all discoveries and improvements, real or supposed are described. The lecturer's aim is to make plain both the method and the rule; but, more than this, to give so clearly the scientific principles thereof, that the student shall be master to the rule and not the slave to a set of formulas.

The lectures on the Practice of Dental Surgery, comprise all the practical details connected with the etiology, pathology and treatment of the morbid conditions and structural changes of the teeth, gums, alveolar processes, and maxillary sinus; the nature, prevention and treatment of salivary accretions, of exposed and diseased nervous pulp; extraction of the teeth, and the use of anæsthetic agents for dental operations; materials used in filling teeth, such as plain and adhesive gold foil, crystal, shred and plastic gold, &c.,and the various methods of introducing the same: form, manner of using and the art of tempering instruments; correction of irregularities of the dental arch; dental hygiene, &c. All the principles and rules laid down are put in practice by students in the Infirmary, under the direction of the Professor of this chair, and the constant daily supervision of the Demonstrator of Operative Dentistry.

It is the aim of the Professor of Chemistry to give an accurate general idea of the principles of the science, dwelling especially upon those points which are of peculiar interest to the dental student. The physiological relations of chemistry are unfolded as far as practicable, leaving particular details to the Professor of Physiology. Careful attention is paid to the chemistry of the metals, and of the porcelain materials used in Dentistry; also to the vital chemistry of anæsthetics. A subject so extensive as organic chemistry, can of course be only partially considered.

But the special chemistry of the mouth, the stomach and the intestinal tube are fully treated. The course is as far as practicable, one of applied chemistry.

The science of Anatomy is treated in its application to Dental Surgery. Its subdivisions, microscopical and comparative receive appropriate attention, together with the chief object of the course, the study of Human Regional Anatomy. Thus, a general survey of the subject is taken, sufficient to enable the student to acquire a comprehensive knowledge of the science. The convenient and well arranged Dissecting Rooms in the College Building, afford ample opportunity for the study of Practical Anatomy, of which it is hoped every student will avail himself.

The rapid advance of Dental Surgery, necessitated a division in the chair of Anatomy and Physiology. This necessity was promptly met by the Faculty several years ago, and a distinct chair and professorship assigned to Physiology. The course of lectures embrace, to a certain extent, Anatomy, general, comparative and microscopical, so that the physical character of organs, and the physical principles involved in their action may be fresh in the memory of the student at the time of description of their functions and their physiological relations. The physiology of the Dental organs is very distinctly set forth. Special attention is paid to the nervous system. Digestion, normal and abnormal, is thoroughly investigated, and the importance of oral digestion clearly defined, as being the first step in that process upon the perfection of which the remaining acts mainly depend. Lectures are given on Hygiene and Dietetics. The lectures on Anatomy, Physiology and Chemistry are as thorough as in any medical college, and special attention is also paid to the Microscopical Anatomy of the dental structures.

In the department of practice no pains are spared to make arrangements for the acquirement of practical skill commensurate with the importance of this branch of tuition. From the middle of October until the close of the session, the Infirmary is open every day.

In regard to Practical Anatomy, the Dissecting Rooms in the college building are superior to those in the majority of medical colleges, and contain every facility for a thorough study of the human body.

Throughout the entire session weekly examinations are held by each Professor on the lectures delivered during the week, and a record kept of the proficiency of each student. These records are consulted at the final examinations of the members of the graduating class, and are taken into account in summing up the votes. Reports are also required from each of the Demonstrators who also keep records of all the operations performed in the Infirmary and Laboratory.

Changes in the Faculty of the Baltimore College of Dental Surgery.—During last month the following changes occurred in the Faculty of this institution: The chair of Chemistry, made vacant by the resignation of Prof. Murdoch, who removed to another city, was filled by the appointment of M. J. De Rosset, M. D., formerly of Wilmington, N. C. but at present Professor of Chemistry in the College of Pharmacy, and also adjunct Professor in the University of Maryland School of Medicine in this city. Professor De Rosset is a practical chemist, having spent years in Europe in the study of his profession, and his appointment will prove very acceptable to the friends of the Baltimore College of Dental Surgery.

Henry Clarke, D.D.S. a graduate of the class of 1859, and formerly associated with Dr. Pleasants of Richmond, Va. in the practice of Dentistry, has been appointed Demonstrator of Operative Dentistry in the place of Dr. H. M. Grant who resigned in September last.

A. G. Bouton, D.D.S. late of Savannah, Geo. and formerly a student of Dr. F. Y. Clarke of Savannah, has been appointed Associate Dental Demonstrator, the College having now three Demonstrators.

The Infirmary of the College having been kept open during the Spring and Summer, there is a considerable increase in the number of patients applying for dental operations.

Per-Manganate of Potassa.—A solution of per-manganate of potassa will be found a valuable remedy in the treatment of disease of the antrum, in the proportion of 5 parts to 100 of water. We have recently applied this solution, in the form of an injection, in several cases of disease of this cavity, and in a short time after its use was commenced the disagreeable odor was diminished and the good effects of the agent apparent. It is also valuable in ozaena and other affections similar in character.

Change of Firm.—The Phila. Dental Manufacturing Co., successors to Rubencame, Stockton & Duff, has passed into the hands of Messrs. Rubencame & Barker, by which title the firm is now designated.

Errata.—In Dr. Hodgkin's article "Hints on Vulcanite Work," owing to a brief absence from home preventing a revise of proofs, we have the following errors to correct:

On page 252, ninth line from top, "plated" read "palatine." On page 254, seventh line from top, for "loose plate" read "base plate." On page 255, third line from top, after the words "there is," the word "no" has been omitted, the phrase being intended to read: "where there is *no* rubber above the teeth."

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ARTICLE I.

Anæsthetics for Dental Operations.

ETHER, CHLOROFORM AND NITROUS OXIDE.

By WALTER BRUCE, D. D. S.

(*Concluded.*)

The excited condition of the nervous centres, is shown by the talking, laughing, shouting, sometimes even raving, and in nervous individuals, hysterical phenomena; by struggles and attempts to rise, also by the voluntary muscular system in nervous twitchings, tremors, cataleptic symptoms, and rigidity of the muscles, which may extend to the larynx, when death becomes imminent from want of air. These symptoms of excitement vary in different individuals, in some being prolonged and well marked, in others very transient, the patient soon falling into a quiet slumber. They are succeeded by symptoms of insensibility, unconciousness and relaxation. The wild cries become indistinct mutterings, the speech thickens, the pulse sinks, the skin becomes cool and moist, the breathings slow. The pulse, however, rarely falls below. its normal standard, even though the

agent be administered for a considerable length of time. The mutterings cease, muscles become relaxed, respiration still slower and sometimes stertorous, the reflex function of the spinal cord and the power of perceiving and responding to external impressions by the brain, is entirely suspended and insensibility is complete. This is the stage in which the operation is generally performed, and it may be kept up by from time to time applying the anæsthetic. It is of short duration and vanishes very quickly after the breathing of the vapor has ceased. Upon the admission of air the patient soon recovers, amazed and confused. Sometimes they laugh or weep and the sensibility is generally morbidly keen. Though the use of the senses soon returns, their perfect utility is slowly regained, and there remains for several days a feeling of languor and general *malaise*, and a disagreeable ethereal odor and taste. The stage of insensibility may easily be tested by touching the conjunctiva or edge of the eyelid, if there is no responsive movement of the lid we know that the reflex functions of the nervous centres are suspended and insensibility must be established. It requires about an ounce or two of ether, or a drachm of chloroform to produce anæsthesia. Chloroform usually produces its effect in two or three minutes. Ether is more uncertain, generally, however, requiring about from three to five minutes, not unfrequently ten or fifteen. These agents should not be administered after a full meal or long fast. If the stomach is full it interferes with the movements of the diaphragm which is to the principal muscle or agent of respiration during the anæsthesia, and vomiting is also apt to be produced. The best time is after a full meal has been digested, as the stomach is then empty and the patient is not weak from want of food. The indications which prohibit the administration of general anæsthetic agents are, diseases of the heart, lungs, brain, kidneys, liver, or any disease which has a tendency to exhaust the nervous supply prevent the proper aeration or circulation of the blood or viti-

ate its condition. If we administer an anæsthetic to a patient with a diseased brain we may expect paralysis of the respiratory muscles; if to a patient with heart disease, syncope; or if with lung disease, asphyxia. Liver and kidney diseases are sometimes attended by dropsy, and may produce death, either by coma, syncope or apnoea, under the influence of the anæsthetic. It would probably be speaking more correctly or exactly to say, instead of apnoea or want of breath, stagnation of the blood in the pulmonic capillaries. Death may take place by apnoea when in the stage of excitement the rigidity of the muscles extends to the larynx closing the rima glottidis and effectually excluding the air from the lungs. We should remember that the blood in the arteries as well as in the veins has been made impure by the inhalation, and that in order to the extrication of the neurine or nerve force, it is necessary that pure oxygenated blood come in contact with the brain substance, and without the extrication of nerve force the heart and lungs cannot be made to act. Syncope is much more to be dreaded than either apnoea or coma. Coma is produced by chloroform or ether in the same manner as it is by opium or any other narcotic poison, namely, by suppressing the functions of the medulla oblongata. If now artificial respiration can be produced and kept up until the narcotic agent is sufficiently eliminated from the system to enable the medulla to perform its office unaided the patient is saved. This has been done in experiments on dogs, and in cases of opium poisoning in human individuals. In apnoea the heart may continue pulsating after respiration has stopped, and resuscitation can be more easily accomplished than in syncope where the heart has ceased to beat and where we have also a benumbed nervous system to stimulate. One of the laws of physiology is that the blood, in order to be kept in the fluid state must be in motion in contact with a living surface. If then motion ceases in the heart, and the blood remains stationary in it long enough for its fibrine to become formed into a clot it is

impossible, with the patient in an anæsthetized condition for resuscitation to be accomplished. And the profuse hæmorrhage attendant upon some operations, such as resection of the superior maxillary, increases the coagulability of the blood. If, in the stage of excitement, rigidity extend to the muscles of the larynx, the anæsthetic should be withdrawn and free admission of air allowed, a few inhalations of which will generally cause the patient to become relaxed and fall back in a state of insensibility. If, however, the rigidity is so great as to entirely close the glottis, the tongue should be seized with the fingers, tenaculum or forceps and forcibly drawn forwards, which will have the effect of opening the air passage, and upon the admission of air, relaxation soon succeeds. So also, when more of the anæsthetic vapor has been inhaled than can be absorbed, producing symptoms of apnoea or what is commonly known as asphyxia, livid countenance, abdominal respiration, &c., the vapor is to be withdrawn and air admitted, when the respiration soon becomes natural. In cases of suspended animation resulting from the administration of chloroform or ether, we rely almost exclusively on means adapted to restoring the functions of respiration and circulation. Fresh cold air is to be admitted to the patient, cold water dashed upon the face, stimulating enemata administered, and stimulating embrocations rubbed upon the extremities and surface, on the chest and along the spine. Caustic ammonia applied to the skin, or, what is better a tumbler full of boiling water with a towel stretched over the top, inverted on the patients breast. Shocks from a galvanic battery have been used also, and a great number of other remedies for restoring a patient in such a condition. Our chief reliance, however, is upon means used to produce artificial respiration, compressing the chest with the hands or split sheet and allowing it to expand again, rolling the patient from side to side, raising and lowering the arms having them at the same time brought slightly to the front, in short any means we can devise by which breathing can be

simulated. The best means of producing artificial respiration is with the bellows, or with the lungs and mouth of an individual. The nozzle of the bellows is introduced into one nostril, the other and the mouth being closed, and the larynx being pressed back in order to close the esophagus, the lungs are then carefully inflated and the chest afterwards compressed or else the walls of the chest allowed to contract from their own natural elasticity. It is asserted by some that artificial respiration can be still better performed by the operator placing his own mouth over that of the patient, observing the precautions just mentioned, and inflating the patients lungs in that way. M. Ricord has saved several individuals by this method, in whom life was so far gone that the pulse and respiration were suspended. A comparison between ether and chloroform has already been made. Ether is much more frequently used in this country than it is in Europe where chloroform is used almost exclusively. It is here considered a safer anæsthetic than chloroform. A much greater number of deaths from the use of the latter agent are published than from the use of ether. Chloroform, however, is more extensively used and is a more powerful agent than ether. It requires less of the chloroform than of the ether to produce the anæsthetic effect. Insensibility is induced in a shorter time with the former agent and its odor is more agreeable. The anæsthetic and after effect of ether are of shorter duration, and its advocates maintain that it is less dangerous. Chloroform has been administered by Prof. Simpson 15000 times (had been several years ago) without any fatal result. It was administered by Mr. Syme 5000 times and in the Crimean war 25000 times without an accident, except probably one case in this war in which an impure article was used. So also in the Italian war and in the Confederate army, for the first three years (which is as far as I have knowledge) no unfavorable result from the use of chloroform has been reported. It has been computed that one fatal case has occurred in every 16000 in

which chloroform has been administered. The computation for ether is still less, and in most if not all the cases in which death has occurred, it was due either to impurity of the article or mal-administration. It is in minor operations such as the dental surgeon has to perform, that the majority of the fatal cases have occurred, operations too in which the anæsthetic is administed more on account of the timidity of the patient than to prevent shock to the system or any great suffering. So that although these agents have been administered so frequently with good results and turned to such good account in general surgery, the dentist does not find in either of them such lan anæsthetic as he would desire, or agents that so nearly approach that desideratum as the next we are about to consider, viz: Nitrous Oxide.

Nitrous Oxide differs from ether and chloroform in being a gas, and in having to be manufactured by the operator, requiring a more or less complicated apparatus for the purpose. Nitrous oxide was discovered in the year 1776 but it was not until 1800 when Sir Humphrey Davy experimented with it, that much of its properties became known. It has been long known under the name of laughing gas, for its peculiar excitant effects when moderately inhaled. When pure it is a colorless inodorous gas with a sweetish taste. It is exceedingly difficult, however, to obtain the gas so pure as to be inodorous. Its symbol is N O, being the protoxide of nitrogen. Its combining proportion 22, and its specific gravity 1569, air being 1000. Nitrous oxide is not a permanent gas but can be reduced to a clear colorless liquid under a pressure of thirty atmospheres at a temperature of 32° Fahrenheit. The liquid differs from some of the other liquified gases in being slowly converted into a gas again; liquified carbonic acid for instance, is converted into a gas with an explosion. The slowness of the conversion of the liquid nitrous oxide into a gas is accounted for in the following way: rapid evaporation takes place from the surface of the liquid, and the latent heat required for the change of

state is absorbed from the body of the liquid beneath, thus keeping up in it a sufficient degree of cold to prevent its assuming at once a gaseous condition with an explosion. The liquid then is always intensely cold. The most intense artificial cold yet known has been produced with this liquid. If a drop of it be let fall on the hand it produces a burning sensation owing to the intense cold. It mixes indefinitely with alcohol and ether. If whilst the liquid is evaporating water be dropped upon it the water is frozen and the liquid converted into a gas with an explosion. Exposed under the bell glass of an air pump it becomes a snow-like solid. The curious experiment of freezing water in a red-hot crucible has been done with nitrous oxide liquid, and mercury can with it be reduced to a malleable condition. Sodium and potassium, metals which have a powerful affinity for oxygen are not oxydized in this liquid, but charcoal unites with its oxygen with such rapidity as to produce combustion, nitrous oxide is a supporter of combustion, bodies burning more rapidly in this gas than in the air. If it be mixed with an equal volume of hydrogen in Cavendishe's endiometer and fired with electrical sparks it explodes with violence and liberates its own measure of nitrogen, water being formed by the combination of the hydrogen and oxygen. Water absorbs four times its bulk of nitrous oxide.

Nitrous oxide may be made by the action of nitric acid on zinc in the following way: Thirteen parts of nitric acid are poured on ten parts of zinc. The result is the formation of nitrate of zinc, two parts of deutoxide of nitrogen and one part nitrous oxide. This process may be illustrated by the following formula: $10\ zn + 13\ NO_5 = 10\ (znO\ NO_5) + 2NO_2 + NO$. The deutoxide of nitrogen may be converted into protoxide by allowing it to stand over moist zinc which absorbs one part of the oxygen leaving nitrous oxide. This is a tedious mode and one by which it is rarely made; it is always manufactured for anæsthetic purposes by the fusion

of nitrate of ammonia. Nitrate of ammonia is made by pouring nitric acid on carbonate of ammonia.

If nitrate of ammonia be thrown on porcelain heated to abont 400° it melts, ebullition takes place and fumes composed principally of nitrous oxide are disengaged. If the porcelain be heated to a red heat the nitrate of ammonia burns. Thrown on a piece of copper heated to a certain degree it is rapidly converted into a gas with an explosion; it is dangerous therefore to undertake to make nitrous oxide in a copper vessel. The fumes disengaged in the fusion of nitrate of ammonia have in them besides nitrous oxide some deutoxide of nitrogen, hyponitric acid, nitric acid, ammonia and probably some others, according to the impurity of the article used. The nitrate is placed in a retort, the retort in a sand bath and heat is applied, the gas which arises is conducted by means of an india rubber tube through purifying solutions into a receiver, from whence it is inhaled by the patient by means of a tube and mouth piece. At the end of the retort there should be a glass bulb attached to receive the water which results from the decomposition of the nitrate of ammonia. Two wash bottles containing, one a solution of sulphate of iron, the other of soda or potassa, have the tubing arranged in them so as to allow the gas to pass through the solutions and be purified. The gas receiver is a large bell-glass-shaped vessel inverted in a cylinder or tube containing water and balanced by means of weights, an apparatus similar to those they have at the gas factories in the cities. The heighth of the inverted vessel in the cylinder indicates the amount of gas we have on band, and the falling of this vessel shows the amount inhaled when the gas is administered. The nitrate of ammonia, from which this gas is made, is composed of 54 parts nitric acid, 17 ammonia and 9 water. Part of the oxygen of the nitric acid unites with its nitrogen and with the nitrogen of the ammonia, forming nitrous oxide, the remainder of the oxygen of the nitric acid uniting with the hydrogen of the ammonia,

forming water. The formula for nitrate of ammonia is written NH_3 HO NO_5 or according to the Berzelean method NH_4 O, NO_5; upon the application of heat a decomposition takes place and we get a result which may be expressed in the following way 2 NO+4 HO or two parts of nitrous oxide and four of water. There is always some of the deutoxide disengaged in the manufacture of nitrous oxide and if the retort is too rapidly heated, red fumes of this gas may be seen in it. The deutoxide may be got rid of by passing the gas through a solution of sulphate of iron; one part of the oxygen of the deutoxide uniting with the iron forming a sulphate of the sesquioxide. Nitrous oxide is also liable to impurities, (principally chlorine), from an adulterated article of nitrate of ammonia used in its manufacture. The nitric acid with which the nitrate is made being impure from admixture of sulphuric acid, and from the nitrate being sometimes adulterated with muriate of ammonia. When sulphuric acid is present in the nitrate of ammonia it may be detected in the following manner: Make a solution of chloride of barium and pour it into a solution of the suspected nitrate of ammonia. If there is any sulphuric acid present an insoluble sulphate of baryta is formed, causing the clear, mixed solution to become cloudy; somewhat in the same manner the presence of sal ammoniac or muriate of ammonia is detected; mix a solution of the nitrate of ammonia with a solution of nitrate of silver, if any chlorine be present the solutions become milky from the formation of the insoluble chloride of silver. Chlorine is removed from nitrous oxide by passing it through a solution of soda or potassa, another method of purifying is to allow the gas to pass through lime water in the receiver. Nitrous oxide once used should be allowed to escape as useless. It has been attempted to purify them (the exhalations) for second use by passing them through lime water or some solution to deprive them of carbonic acid. This is poor economy and should not be done. Carbonic acid is not the only impurity

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peated. Nitrous oxide as a medicinal agent is a diffusable stimulant, and is used (the aqueous solution) in many cases in place of alcohol. By Dr. Zeigler, of Philadelphia, it is very highly extoled and its use recommended in a great variety of diseases. It differs from the other anæsthetics, ether and chloroform in being a supporter of combustion, when introduced into the system by any means it rapidly increases oxidation and consequently the amount of carbonic acid in the blood. It has so far, proved to be far superior to ether or chloroform as an anæsthetic in minor surgery. Its effect is much more evanescent, the stage of insensibility being more rapidly induced and the recovery therefrom much quicker than that of ether or chloroform. The after effects are also much more transient, there beihg rarely any disagreeable sensations remaining after it has been taken. Anæsthesia is much more agreeably produced with this agent than with any other anæsthetic. Its inhalation is generally attended with very agreeable sensations, by some the sensations are described as being exquisitely pleasurable and it is rare that a patient refuses a second administration of the gas. Its chief recommendation, however, is its safety. Different theories have been advanced in regard to its modus operandi, and are still being discussed. By some it is thought to produce its effect by simply acting as a negative agent, preventing the elemination of carbon from the system, which remaining in the blood produces the anæsthesia. By others it is thought to act by producing a state of super excitation; the vital functions are excited beyond a normal standard, and the cerebral functions in consequence so deranged as to produce anæsthesia. Nitrous oxide is not a harmless agent as some seem to suppose. Death has been produced by its administration for anæsthetic purposes, and though death when it occured was in cases complicated with serious disease of some of the important viscera, yet we should remember that it is an agent that acts with great power on the human system and should always be administered with great care.

ARTICLE II.

A Case of Hæmorrhage Following the Extraction of a Tooth.

By Dr. J. D. Patterson, Lawrence, Kansas.

I have lately had a case of severe hæmorrhage from the socket of an extracted tooth, which I deem might be of interest to you and the *Journal.* The patient, Rev. M. A., of this city, called at my office on Friday to have the first inferior molar of the right side extracted. He has been suffering from impaired health and lacks *tone* in the system, The tooth being badly diseased I extracted it. The bleeding was profuse but I supposed it nothing more than usual as the parts were turgid with blood, and sent the patient away. On the following Saturday he called at 9 A. M. Bleeding from the socket had continued incessantly, but slight. I removed the clot and filled the cavity with cotton and tannin, and the bleeding was stopped. Monday morning the patient called with very severe hæmorrhage, and stated that during the night the bleeding returned, saturating the parts of his bed near the head thus awaking him. When he came to the office he was unable to walk without staggering being so feeble from loss of blood, his sight also was dimmed. I cleaned the cavity, removing the old pellets and plugged with cotton charged with "*Monsel's sulphas ferri*", used pressure with the thumb until bleeding was stopped, dried the parts and coated with plaster of paris, keeping dry till hard and discharged the patient. No return of bleeding. The plaster for thirty hours kept hard and seemed to do as well as any compress could, besides, having the advantage of being easily and quickly applied.

The second case is that of Mr. S. H., aged 34, a merchant in Maehren. The patient had suffered for eight or nine years with a continuous pain of the last tooth of the lower jaw, sometimes on the right, sometimes on the left side. It was his custom, when he became tired of the pain, to have the painful tooth extracted, but at the end of four weeks the pain invariably returned in the next tooth to the one which had been extracted. In July, 1868, he came to Dr. T.'s office asking to have the second lower right bicuspid extracted. The tooth appeared perfectly healthy and he tried before extraction, all therapeutic remedies, without the least effect. He made an examination of all the extracted teeth, which the patient had preserved, and found the most beautiful example of pear-shaped odontome and osteo-odontome. After this examination he was compelled to extract the tooth, the pulp cavity of which was perfectly full of osteo-odontome and completely obliterated. Three weeks afterwards he prepared a partial set of artificial teeth for this patient. He arranged the teeth two lines higher than the tops of the other seven remaining teeth of the lower jaw, but a month after the patient informed him that the pain had begun again in the next tooth. In September this tooth was extracted and found filled with the same peculiar formation. In October again, the symptoms of pain showed themselves in the next tooth, the canine. The patient is now under the treatment of a specialist in Vienna.

This affection, in my opinion can only terminate on the removal of all the teeth. But the cause for the recurrence of the pain in the tooth next to the one removed is doubtful. It is probable that the new formation began in each tooth a long time previous to the extraction of the one behind it; possibly at the same time with the painful one.

Atrophia and perfect obliteration of the pulp canal occur very often in old age, but in persons between 24 and 36 years very seldom occur new formations of this kind. The best histological works and examination have been pub-

lished by Tomes, Ulrich Wedl and Heider. In 1868 Prof. Dr. Hahl, of Halle wrote a scientific monographia.

He divided the new formation into

(1.) Odontome, Dentine, new formations.

(2.) Osteome, Cement, new formations.

(3.) Osteo-odontome, Dentine, and Cement, formations mixed.

ARTICLE IV.

How to Remove Wax from the Pins of Teeth Prior to Packing with Rubber.

By B. M. Wilkerson, D.D.S.

After separating the flask, place the half which has the teeth in it in a basin; then pour *boiling* water (a quart will be sufficient) in a large stream on the pins at a distance of three or four feet. Use the precaution to have the flask warm to prevent cracking the teeth. If properly done it will remove all the wax a *great* deal better than boiling, and *much* sooner.

ARTICLE V.

East Tennessee Dental Association.

By Dr. W. F. Fowler, Greeneville, Tenn.

The East Tenn. Dental Association met pursuant to adjournment, at the Lamar House, Knoxville, Tenn., October 20th 1869, at 3 P. M.

The Association was called to order by the President Dr. John Fouche, who ordered the minutes of the last meeting to be read, after which several new members were elected. The increase in members, both upon the rolls and of members present, show the growing interest manifested in this body and its objects. An interesting paper on Hæmorrhage after Extraction was read by Dr. Wm. F. Fowler—the various remedies and means for arresting the same were dis-

cussed ; after which the Association adjourned to meet next morning at 8 o'clock.

SECOND DAY.

The morning was occupied by a very interesting and instructive clinic by Dr. J. T. Cazier.

The rest of the day was consumed by discussions upon the various methods of treating Superficial Decay, removing Salivary Calculus &c., also the different methods of filling teeth.

THIRD DAY.

A clinic also was held by Dr. John Fouche in the forenoon, which was witnessed also with the greatest of interest, the Association feeling greatly benefitted by the clinics of the two mornings. Two Essays were read by Dr. Wm. H. Cooke, one on Necrosis of the Alveoli, the other on Tumors of the Mouth; both were highly entertaining and instructive. Dr. Cazier drew up and presented to the Association a bill memorializing the Legislature of the State of Tennessee to pass the same, for the better regulating the practice of Dentistry in Tennesssee.

Drs. Fouche, Cazier and Cooke were elected to represent the Association at the next meeting of the American Dental Association, which meets in the city of Nashville. Also Drs. Fowler and Speck were elected to represent the interests of the same, at the next meeting of the Southern Dental Association at New Orleans. Several members having to leave, the Association adjourned after electing the following officers for the ensuing year, to wit:

President.—J. T. CAZIER, D.D.S.
Cor. Secretary.—WM. F. FOWLER, D.D.S.
Rec. Sec. and Treas.—WM. H. COOKE.

ARTICLE VI.

American Academy of Dental Science.

By EDWARD N. HARRIS, D.D.S.

The second annual meeting of the American Academy of Dental Science, was held in Boston, September 27, 1869, at

dical Society, No. 36

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doing ample justice to the viands, very pleasant after-dinner speeches were made by Dr. Harwood, Rev. E. E. Hale, Rev. Mr. Hinckly, of Dorchester; Dr. J. H. Foster, of New York; Drs. E. T. Wilson; John Clough, of Woburn; E. N. Harris: E. G. Tucker; W. W. Codman; J. L. Williams; A. T. Emery; H. F. Bishop, of Worcester; D. S. Dickerman, of Taunton, and Messrs C. H. Frothingham, M. L. Tucker and C. P. Wilson,

SELECTED ARTICLES.

ARTICLE VII.

Gold Foil.

By Dr. G. V. Black.

(*Concluded.*)

Forms of gold.—A few words may be said of the manner of handling and forming the pieces of gold. This may be stated as a positive rule to which there should be no exception: that gold foil, the welding property of which is to be made use of, should never be touched with bare fingers, for the reason that the exhalations from the skin always injure this property more or less. The gold is easiest and most perfectly worked with the fingers neatly gloved with fine chamois skin or linen. These gloves should not remain on the hand any longer than is actually necessary to do the work, and should be very carefully kept. It may be thought that it would be inconvenient to handle the gold in them, but this soon wears away with practice, and becomes easier and the results more satisfactory than with any of the gold crumpers that I have seen. I notice some ingenious Yankee has gotten up a patent instrument for rolling up the ropes, which consists of two boards with a strip of rubber stretched between. This may produce a very nice rope, but after studying the effects of rubber on gold, I should not prefer it to the fingers. We should remember that it is not moisture merely that injures our gold, for that is driven off by

annealing.; but it is the gases and solid residue from these exhalations, compared with which the sulphurous acid exhaled on rubbing rubber is no improvement. I would kindly suggest that he substitute a nice piece of chamois in place of the rubber.

The Block.—This form is best made by taking the amount of gold wanted in a single piece, and crumpling it loosely together, and then bringing it into a square form with a pair of flat-bladed thumb pliers. The whole operation should be conducted in such a manner that the finished block will be of equal density thoughout.

Ovoid Pellets are made in the same manner as the block, except that they are rolled to the desired size and shape—round or oblong—with the gloved fingers.

The Rope is made by folding a sheet or part of a sheet of gold loosely together into a long round roll, and then twisting it into a moderately compact rope. It is also made by rolling the gold in a napkin, and by crumpers, but much the best form is produced by the fingers gloved with chamois skin or linen.

The Pellet is produced by cutting the *Rope* into short lengths. I am using a pair of shears prepared with a graduated scale attached to one of the blades, with which the length of each pellet is definitely and easily measured as it is cut, without any loss of time whatever. This is a very convenient and useful instrument to those who may wish to adopt definite sizes of the pellet.

The Ribbon is best produced by using two prism-shaped blocks of convenient lengths, (one side about half the length of each of the others is the most convenient form.) A paper knife or ivory spatula may be used instead of the second block. The gold is laid on a piece of velvet, the thin edge of one of the blocks placed on its centre—the second block is now passed under the edge of the sheet, which is folded over the first, which is withdrawn, and the gold brought down smoothly by passing the block over it. This operation is repeated until the desired width is obtained, and the rib-

bon is ready for use. I know of no other mode of producing ribbon which can compare with this for perfection or ease to the operator.

The Cylinder is made by rolling a ribbon smoothly and compactly upon a broach or four-sided drill, as a ribbon is rolled upon a block, then by rolling the broach or drill backward it is loosened, and the cylinder removed. The width of the ribbon should equal the desired length of the cylinder. Many other forms have been used, more or less, but they are generally modifications of those given, and hardly require separate consideration.

The form in which gold foil may best be used in filling teeth, is a question of no small importance, and deserves much careful consideration. We want that form which may best be impacted securely and perfectly into grooves and retaining pits, and against the walls of the cavity. Compared with these points solidity itself is a secondary consideration. If our form of foil should not admit of the ready accomplishment of these objects, our whole work is liable to fail, no matter how solid other parts of the filling may be, or how beautiful it may appear. To meet these requirements our form of gold should be very impressible, and take readily the form of the wall of the cavity against which it may be impacted. These requirements seem to be most perfectly met by the form of the block. This form of gold is soft and sponge-like, may be pulled this way or pushed that way with the plugger, and adapts itself most perfectly to the walls of the cavity, but has the objection that it requires more labor to consolidate it perfectly than most other forms on account of the many wrinkles and sharp angles which must be beaten out. This objection is perhaps much greater in theory than in actual practice, and whether it is or not, the impaction against the walls is of much more importance, as before stated, than the actual solidity of the body of the work; provided always, that the solidity is sufficient for the ordinary wear and tear of mastication, which is easily attained with these blocks. The working of the ovoid pellet

is about the same as the block. The next form nearest resembling the block is the pellet. This form is not crumpled quite so much as the block, yet is almost as soft,and is well adapted into working into small cavities or retaining pits, grooves and undercuts. The use of pellets cut from ropes larger than those made from a single sheet of No. 4 gold is objectionable, onaccount of the condensation which occurs at the ends of the pellets in cutting them. The ease and rapidity with which they may be prepared is quite an item in their favor, in all cases where small pieces are needed. The rope has been much used in times past by beginning with one end and folding it into the cavity, condensing each fold as it is laid in. I think this practice is mostly abandoned on account of the obvious difficulty of keeping the rope free from the moisture of the mouth, and that it obscures the cavity too much.

The cylinder is a very popular form of gold with many operators, and seems to have been gaining ground for a number of years. It is used by setting it on end in the cavity to be filled,and condensing against one of its walls, or if it be an approximal cavity, by laying the end of the cylinder out over the wall. With this form of gold there are no angles to break down in condensing, so that the solidity is attained with less labor than with most other forms in use. In fact, the gold is placed in the cavity in a very smooth and compact state, so that little more condensation is required, and is generally used in pretty large masses, particularly if the cavity be large. It is not so easily impacted into any irregularities which may occur in the walls of the cavity, although in the main very great solidity is attained. At those points along the wall where two cylinders lie against each other, triangular openings are liable to occur. In case of approximal cavities where the plan is to lay the ends of the cylinders out over the walls, this may result in serious mischief. This may be illustrated by taking three little rolls or cylinders of paper, with square ends, and placing them together, a triangular opening will be observed in the

centre; or if you take two of them and press them together against a flat surface, a similar opening will be observed between them. It will be found a very difficult matter to close these openings perfectly and solidly by any practical amount of pressure. If the space be filled at all it is apt to be filled very loosely. The difficulty is not lessened by substituting gold for paper, and I consider it a very grave objection to the general use of cylinders in filling teeth, especially in approximal cavities. I have myself been greatly mortified to find fillings which I had thought very perfect, imbibing moisture causing decay to start, evidently from this cause; and have also noticed it in fillings made by some very fine operators. To overcome this trouble requires considerable manipulative skill, and much good judgement, and even then it seems to be a somewhat dangerous form of gold to use largely.

The ribbon cut in short lengths or folded in as rope, may be used in filling teeth; but is scarcely applicable to the filling of cavities, for the reason that it is too much condensed, and too many hard corners are liable to occur to allow it to be spread and impacted perfectly against the walls of the cavity. This form of gold cut into convenient lengths may be used with great advantage in building up lost parts of teeth, after the cavity has been filled out even with the walls. In such cases the slips may be laid on smoothly, and condensed with less labor than any other form of gold. There seems to be very little attention paid by dentists to the sizes of the pieces of gold used; or, I should say, they do not adopt any regular system of sizes, but prepare their gold according to the size of the cavity to be filled. Now to prepare gold in such a manner as this, seems to me to be forever experimenting with vague and undefined sizes. And we cannot feel that degree of confidence and thorough knowledge of what is coming under our instrument that we should. I would recommend every operator to adopt some regular gradation of sizes which may be found convenient, and adhere to them closely in all their work.

A few weeks' observation will be sufficient to determine

upon those sizes which will be most convenient for their range of operations. Then a known and fixed size of gold will be chosen to be worked to a given place as the eye may dictate, and there will be no vagueness as to the working of the piece under the instrument, for it will be perfectly familiar. Those who have not tried this plan will be surprised at the relief it will afford in all difficult operations. Instead of feeling their way along with perhaps some misgivings as to whether the gold prepared is going to suit the situation all the way through, they feel that they have definite and familiar sizes of gold at hand, at once adaptable to any situation; a view of which is always sufficient to determine the size or form to be taken. The adoption of such a system will be of no small advantage to those writing and speaking upon the subject, in making themselves understood or in conveying a distinct idea of their plans to their brothers; for it is often the case that the size of the gold is as important as the form. We all perhaps feel how indistinctly our idea of the size of gold used in any given case is conveyed in any form of words used by the profession. We need some system by which an accurate idea of this kind may be easily expressed and generally understood. Then much of the vagueness which hangs around our operations when put in the form of words, would disappear. But such a state of things cannot possibly occur when operators cannot tell in words what size the pieces of gold used in such and such an operation should be. The plan which I have adopted, and which, perhaps, is as simple and as easily understood by all as any other, is that of naming each piece according to the number of grains, or the fraction of a grain contained in a piece. Thus, if a sheet of No. 4 foil be cut into four equal parts, and each part made into a block, they will be called one grain blocks; if it be divided into eight equal parts, they will be half grain pieces. No. 2 gold divided as the last will make one-fourth grain pieces. A sheet of No. 4 gold would make a four grain block or cylinder; a half sheet would make a two grain piece, and so on throughout all sizes

that may be wanted. One number of foil is adapted to this system as well as another, and it is applied to all forms of gold alike. This plan presents an unlimited variety of sizes a very few of which, when properly selected, will be found sufficient for any operation. Any one using any selection of these will understand readily what is meant when any one of them may be mentioned, whether they be sizes he is in the habit of using or not.

I am using half a dozen of these in my office for general use; 1 grain, $\frac{2}{3}$ grain and $\frac{1}{2}$ grain in the form of blocks, and $\frac{1}{3}$, $\frac{1}{8}$ and $\frac{1}{4}$ of a grain in the form of a pellet, and occasionally some of larger or smaller size. But in whatever form my gold is prepared, it always takes these definite proportions.

I find this system very convenient in directing my assistant in the gold I may want; and, in fact, it is a convenience in every way you may put it.

The preparation of gold I make entirely the work of my assistant. She has her chamois skin gloves and all the necessary instruments in a convenient drawer, and, whatever else goes wrong, every piece of gold that comes to the tray to be used must be just right. And I have no hesitation in saying that it may be done as well, and often better, by a properly instructed assistant, than the operator would do it for himself. And more than this, I have my assistant do all my annealing. For this purpose she is supplied with some annealing forks, which are made by flattening an old excavator, splitting it up with a separating file, and sharpening the points. This will stick into any piece of gold, and hold it without condensing it, and is preferable to the foil pliers in general use. With one of these instruments she takes such a number and form as I may call for, passes it through the alcohol flame, and then into the cavity to be filled, when I take it with my plugger. And while I may be fixing it for the final condensation, she has taken up and annealed another piece, which is held while the first is condensed with the mallet, she always bringing the number called, and an-

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its more exposed position. One was a case of double fracture, where the line of fracture ran just anterior to the insertions of the masseter muscle on either side, leaving the central portion detached and lowered by the depressor muscles of the chin. It seemed impossible to remedy the displacement in this case by the ordinary means taught in the schools, and described in surgical works for the treatment of this fracture. So also did the ordinary means fail in another case of double fracture through the symphysis and of the body near the angle. In neither of these cases was Gibson's, Barton's, or the four-tailed bandage, though faithfully tried, successful in keeping the fragments in satisfactory apposition, even with the assistance of a paste-board splint and compress, cork wedges grooved to fit the teeth, ligatures of thread or silver wire twisted around the teeth, or, lastly, the plan of Professors Mutter and Smith, of a leaden clamp or grooved plate fitted on the teeth.

I searched the many text-books and works on surgery in vain for a suitable apparatus to remedy the effects of the usual appliances in these cases Surgical writers have not, I think, given the subject proper attention. They tell the student of the usual seat, etiology, and indications for treatment of fracture of this bone, what muscles act in causing displacement, and how they are to be counteracted, then the subject is dismissed by the assertion that there is no difficulty in managing any of the varieties of this fracture if the student will only apply a compress, mould a piece of pasteboard, or of gutta percha to the jaw, and bandage the part. In fact, any means may be resorted to capable of carrying out the indications of restoring the line of the jaw, drawing it up to the superior maxilla, acting as a splint, to prevent displacement upwards, downwards, or laterally.

Mr. Fergusson, after alluding to various pieces of mechanism that have been devised for treating this kind of fracture, and simply mentioning the ingenious invention of Mr. Lonsdale, remarks, "For my own part I should commonly prefer the paste-board splint, cork, and bandage above recom

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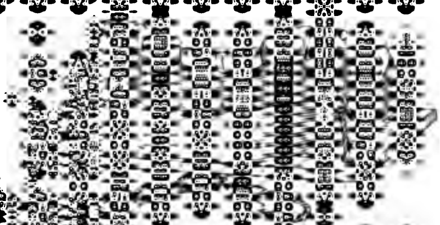

the result of

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plate (A) or
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y dentists, in
pliable sub-

stance), to which grooved plate are welded projecting arms (C, C), of stout iron wire, about opposite the bicuspid teeth, or a point corresponding to the corners of the mouth, arched so as comfortably to project out of the mouth without interfering with the lips. Herein the instrument differs from that of Lonsdale's, whose grooved plate is attached to a vertical bar passing over the centre of the lip, and is consequently more inconvenient to the patient than the former, the arms of which emerge *at the corners of the mouth.* The ends of the projecting arms are bent to form holes through which pieces of cord, thread, or wire are passed to attach the dental splint to a piece of wood (B), say a portion of a cigar-box cover, for a chin piece, placed under the jaw, serving the purpose of a submaxillary splint. This latter should have four holes in it, two on either side, to make it more secure.

This comprises the entire apparatus, and is applied to a fracture of the lower jaw, whenever the fracture is in the body of the bone by fitting the dental splint to the teeth, placing a compress of patent lint or some soft material between the under surface of the chin and the submental splint, then tying the tails of the thread, or twisting the wire previously passed through the holes in the latter splint, as seen in the wood-cut, to the projecting arms of the former, thus doing away with the necessity of *bandages over the head altogether.*

After trying the usual methods by bandaging unsuccessfully, as well as the instrument of Mr. Lonsdale, this apparatus was applied with the most *satisfactory and agreeable results.*

The dental splint is represented as being fenestrated ; the object of this is to allow the teeth of the upper and lower jaw to dovetail, or articulate with each other, as the dentists say, in cases when there is an inequality in the size of the teeth, or irregularity in their position, so as to bring the fractured ends of the bone into perfect coaptation, without one or two projecting teeth interfering with an accurate ad-

justment of the fracture. If this apparatus is properly understood and applied to the fractured jaw the patient can go about his usual avocations, *take his food, and talk without fear of displacing the fragments of the broken bone*, and without the necessity of wearing a bandage or handkerchief tied over the head.

The objects had in view are precisely those laid down by Lonsdale, and the advantages, such as lightness, adaptability, simplicity and convenience, gained by this instrument over that of Lonsdale's, or any of those figured in *Hamilton on Fractures*, or in Wale's *Mechanical Therapeutics*, cannot, it appears to me, be disputed.—*Am. Jour. Med. Sciences.*

ARTICLE IX.

Pivot Teeth.

Dr. J. Hardman in a communication to the *Missouri Dental Journal*, says: I notice in the August number of the *American Journal of Dental Science*, page 365, a communication from the pen of J. B. Bean, M.D., upon "Pivot Teeth." It gives me much pleasure to see that this subject is being once again brought before the profession with a prospect of a fair degree of notice.

The time has been when a pivot tooth and the ability to well plant one received quite a share of honorable credit. But for the last ten or fifteen years a great neglect of this variety of work has prevailed. And indeed, we can frequently meet dentists who say they never use pivot teeth, or plant artificial crowns upon the natural roots.

Several causes have contributed to this. Amongst the most prominent is that of cheap dental plates, introduced by the use of rubber. Another is the use of adhesive gold in building out large portion or entire crowns of front teeth. The first of these causes, good and efficient operators will not be influenced by. But the second will require a little more persuasion to obtain an acknowledgement from many, that a porcelain tooth, planted with pivot, ought to be pre-

ferred to a gold crown in the front part of the mouth. Of course, no rule can be brought to bear in determining the true relative value of the two modes, as much of the objection rests with the damage the yellow glaring metal has upon the physiogomy of the patient; and which is very much modified in effect by the amount the person exposes the teeth. But all must admit at once, in beholding one of these grinning subjects with a large yellow advertiser in his front teeth. the immense injury done to his natural expression. He strikes you at once as being very proud of the show of jewelry (whether worn in proper place or not) or being rather easily persuaded to be a walking advertiser for his operator.

No one will be likely to deny that a front root sufficiently healthy to bear filling from the apex (with mallet pressure) will, if properly done, equally sustain a pivot tooth. And how immeasurably more preferabe would the porcelain tooth be than the mass of gold.

The third cause, that it is difficult to obtain good pivot teeth (though true) ought not to bear weight in this matter, as the want will most assuredly be supplied by our manufacturers so soon as evidence of their want is made known.

I have tried quite a variety of modes for planting these teeth. However, I have never placed a gold tube in by filling around with gold foil, nor have I fitted a gold pivot to permit daily removal, by the patient, as recommended by Dr. Bean. At present, I think I see no especial advantage in these featnres. The filling around the tube to secure it must necessarily reduce the strength of the root just where it is the most liable of being split in hard biting. And. if the tooth may be removed *ad libitum* by the patient, it is almost absolutely certain that from negligence or otherwise the tooth will be lost, or may be swallowed with the food.

After trying various plans for the use of metal tubes and pivots, I have finally adopted the non-metallic mode and abandoned all other, except where the root is too much out of range, or where much decay has reduced materially the dentinal strength.

My favorite mode after the road is prepared with the excising forceps, file and drill, is to proceed at once to fit a crown mounted upon a temporary pivot made of pine wood.

If a nerve is to be removed, cover it with a little wax, and congeal with atomizing spray and extirpate to the apex. Wipe out and apply a small dossil of cotton wool saturated with creosote with a blunt broach up out of the way of the drill. Then drill first with a conical, and next with a square point, to little more than two lines in depth. Then select a tooth of proper size, shade and form. Also, with correct pivot hole to correspond with the root. This latter is best done by placing a piece of pine or match stick in as a trial pivot. Now, if all is favorable so far, grind the base to fit truly upon the base of the root. To do this, it is a good plan to file with the same convex surface used to file the base of the root, a concave notch in a piece of wood, and by a little experience a good fit is secured by repeated trials to this surface. Then again try on root with pine trial pivot, and see that position, length, &c., are all right. Now cleanse out the canal, which has most likely ceased bleeding from the apex, and place again cotton and creosote in the apex of the root, and plant the tooth upon a pine pivot.

This pivot is prepared by drawing a good piece of white pine through the graded holes of a draw plate until sufficiently condensed. The patient is dismissed for a fortnight or more, with the injunction that if pain or swelling ensue, to return at once.

If upon the return all is going on aright, remove the tooth, clean the canal, and place a dossil of cotton or bibulous paper with creosote well packed into the apex, whether the nerve has recently been removed, or has long since been dead. And over this pack oxychloride zinc, and when sufficiently hard, cleanse out the pivot hole to the proper depth, and replant the tooth with permanent hickory pivot.

To insure success, and the best possible results, every part must be properly adjusted, and the root must be in a good

state of health, and the patient enjoying a good constitutionality.

A single pivot tooth, aided by natural teeth upon either side, of course does best. However, I have a few patients who have four to six pivot teeth placed continuously on the front superior roots which have been in service over seven years, and but one or two of the pivots have required renewing.

I have, also, in a few cases engrafted successfully with wood pivot upon the root of the front bicuspid. This root when cylindrical and favorably situated, will bear pivoting. The porcelain canine tooth will be more readily ground in shape for this purpose.

I insist that the profession pay more regard to this variety of artificial teeth. They are the most useful, natural and beautiful.

ARTICLE X.

Mercurius Vivus.

By C. S. CHITTENDEN.

Some year and a-half or two years ago, Dr. H. S. Chase, now of the *Missouri Dental Journal,* called the attention of the profession, through one or more of the dental journals, to the efficacy of the Homœopathic preparation of mercury, called mercurius vivus, in the treatment of periostitis. It was a new thing to me, and as I, in common with most of the dentists of the province, was, and am frequently troubled with patients returning and complaining of more or less tenderness about the roots of teeth, after having had the nerves extirpated, and the roots filled, thus indicating that inflammation of the periosteum had supervened, I resolved to test Dr. Chase's prescription. Accordingly I called at one of the Homœopathic Pharmacies and asked for the drug. On being told for what purpose I wished to use it, the person in charge replied, "We have emplowed it for tenderness of the teeth for years, with marked success." I procured two ounces

of the third decimal trituration, enough to last long enough to test the thing thoroughly, and waited for the first patient. For the purpose of giving the result of my treatment of this vexatious disease, and of inducing others to try this remedy, I give a short history of a few cases in which I employed the drug.

August 7th, 1868.—Filled the roots and crown of the first left superior molar, for Mrs. E. M.———, aged about 25; strong and healthy. Aug. 10th, Mrs. M———, called to say that she had been suffering for some hours with a dull heavy pain in the tooth which I had filled, but the pain had increased so much that she could bear it no longer. I gave her four doses of the mer. vivus, each dose containing about as much as would lie on a five cent piece, and requested her to take them at intervals of three hours. Aug. 12th, Mrs. M———, called, pain all gone, and tenderness nearly so.

Case 2.—Mr. T. C——, called to consult me with regard to the right central and lateral incisors of the lower jaw. On examination I found that the teeth were not decayed at all, but were slightly discolored, and very tender to the touch and had been so for two or three days. I decided at once that the nerve had been injured or destroyed by a blow on the teeth, or a fall, by which they had been loosened, sometime in the man's early life, but he could not recall any accident of the kind. He stated that a few days before, in biting a hard biscuit, he had felt a slight twinge of pain in those teeth, and that the soreness commenced from that date. I resolved to try the mer. vivus in this case, too, as the nerve cavity in these teeth is so small that there would be less fear of trouble from its acting as a reservoir for holding fetid matter arising from the decay of the dead nerve, than is usually found in teeth whose nerves are large. Accordingly, I gave him four powders, and directed him to take them at intervals of four hours. Two days after he reported himself free from pain and the soreness nearly all gone.

Case 3.—Miss M———, of Belleville, called about a severe tenderness of a left superior bicuspid, which had been filled

a few days before, by Dr. Relyea. The nerve had not been uncovered while being prepared, but the dentine had been exceedingly sensitive. For a week after the filling, the tooth had given no annoyance, but, then Miss M———, began to feel a slightly painful sensation on closing her teeth together which increased in severity till she called on me. I prescribed mer. vivus as in Cases No's. 1 and 2, but she objected that her family were allopathic, and she didn't believe in "sugar pills." However, after my assuring her that the medicine could not injure her she consented to take it, and promised to come back and let me know its effect. Three days after she called and told me that she had been entirely relieved in a few hours after taking the drug.

I might relate a score or two of similar cases but these will suffice to show that this drug may be used with decided benefit under certain circumstances, and I refer to these for the purpose of inducing others to try it. It is to be hoped, however, that no dentist will exercise less *care* in treating teeth whose nerves have been devitalized, than he otherwise would because a remedy has been found which acts most beneficiently when disease supervenes, after the *greatest care* has been taken with such teeth.—*Canada Journal Dental Science.*

MONTHLY SUMMARY.

Tetanus.—Dr. Dunlap was called on the night of March 20th, to see Miss S. Found her with jaw firmly set; one of the attendants had taken the precaution to place a stick between her teeth, which left room to administer remedies. She had been in that condition about six hours. I learned that about two weeks previous to that time she had singed her foot on the under side, and had so neglected the wound that it was dirty, swollen, suppurating and very offensive. I immediately ordered comp. syrup morphia, spirits vini Gallici aa f℥ij. Teaspoonful every ten minutes. Also ordered chloroform by inhalation. As soon as the chloroform took effect, the muscles relaxed, the stick fell from her mouth, and she seemed in every way comfortable. In about

one hour she rallied from the effects of the chloroform and talked. The mixture of syrup morphia was continued in teaspoonful doses every half hour for three hours, until she quietly fell asleep. In the meantime the wound had been cleansed, and poulticed. When I called again next day I found her walking about and feeling quite well.—*Med. & Surg. Reporter.*

Aluminum.—The scientific editor of the *Independent* says: In his *Journal of Applied Chemistry,* Professor Joy says that a few years ago a pound of aluminum could not have been purchased for $200, and even at that price there were few manufacturers hardy enough to take the order. At the present time it can be readily manufactured for seventy-five cents, if not for fifty cents a pound; and the probabilities are that we shall soon be able to obtain it for a quarter of a dollar. Its principal use thus far is in the manufacture of aluminum bronze, or alloy of copper with ten per cent. of aluminum, and which possesses remarkable strength, tenacity, and elasticity.

Aluminum will prove a very important and useful metal: useful in the manufacture of surgical instruments and appliances etc., and we are glad that it has at last reached the inevitable point of a material reduction in price.

Chloral—A New Anæsthetic.—Monsieur Liebreich has presented a memoir to the Academie des Sciences, which contains some interesting details concerning a new anæsthetic he has just discovered. An important difference between this new chemical compound, which he calls "chloral," and all other substances used for the purpose of producing insensibility, is, that it is administered by absorption instead of inhalation, and this enables the dose applied to be measured with greater accuracy. On passing into the system it becomes decomposed into formiate of potassium and chloroform, and produces more perfect insensibility than either ordinary chloroform or ether. Its use is said to be unattended by any danger. In a very painful and difficult operation lately performed on a woman, M. Liebreich applied chloral with perfect success, the patient being kept under its influence for over two hours.—*Med. & Surg. Reporter.*

Why is the Production of Pus a Cause of Exhaustion?—Every one knows that when a patient is suffering from a suppurating wound or abscess, his system becomes rapidly exhausted. What is the cause of this? Is there anything in the material of pus to explain it?

Pus, as seen under the microscope, consists of two parts, a fluid portion called the *liquor puris*, and certain histological elements, called *cytoid or pus corpuscles.* The former is a clear, colorless or slightly yellowish fluid with a feeble alkaline reaction. The latter are organized materials, and consists of a cell membrane, with a nucleus adhering to it, and viscid hyaline contents.

In these organized materials lies the secret of systemic waste in large suppurating wounds. Their production necessitates a large expenditure of vital force—quite as large as does the embryo material for the building up of true tissue. It is not the mere loss of material, but it is this outlay of vital force that causes exhaustion to the suppurating patient.

For this explanation of this hitherto unexplained difficulty the scientific world is indebted to Mr. Paget, surgeon to St. Bartholomew's Hospital, London; and he, as he modestly intimates, to his house-surgeon, Mr. Butcher.—*Am. Eclectic Med. Review.*

Death from Bichloride of Methylene.—The first recorded death (as far as we are aware) from the inhalation of bichloride of methylene occurred this week in Charing-Cross Hospital. The patient, who had been greatly reduced by malignant disease of the jaw, was about to be operated on by Mr. Canton. The anæsthetic agent was being administered by Mr. Peter Marshall, who has had great experince in its use, and only a very small quantity had been given when the fatal collapse occurred.

A Young Tobacco Chewer.—In the *Medical & Surgical Reporter* a physician of Portage county, Ohio, relates a case within his knowledge where a boy, now some fifteen years old, has used tobacco since the age of five months. When five months old, being a nervous and fretful child, a plug of tobacco was placed in his mouth and produced a soothing effect. The remedy was often used during infancy, and through the teething period, and before the child could talk plainly it was a confirmed tobacco chewer.

Tobacco—The Quantity Consumed and its Effect on Youth.—Few, perhaps, are aware of the extent to which the weed is used both in Europe and America. And its consumption seems to be on the increase. The quantity, in ounces, per head, which is consumed in the United States and Europe is estimated as follows:—Belgium, 150 to 160; Holland, 130; Denmark, 120; United States, 120; Austria, 110; Norway, 100; France, 80; Spain, 70 to 80; Sweden, 70; Great Britian, 60 to 70; Portugal, 50 to 60; Russia, 40; Sardinia, 40; Tuscany, 30 to 40.

In the year 1852, the number of cigars consumed in the city of Paris alone was 200,000,000; in the year 1867, the number increased to 761,625,000.

It is said that a very marked degeneracy of Parisian physique has been noticeable in late years, and that one of the causes of this degeneracy is undoubtedly the excessive use of tobacco.

A writer in the *British Medical Review* says:

Dr. Decaisne, in the course of investigations on the influence of tobacco on circulation, has been struck with the large number of boys, aged from 9 to 15 years, who smoke; and has been led to inquire into the connection of this habit with the impairment of the general health. He has observed 38 boys, aged from 9 to 15, who smoked more or less. Of these, distinct symptoms were presented in 27. In 22 there were various disorders of the circulation—*bruit de souffle* in the neck, palpitation, disorders of digestion, slowness of intellect, and a more or less marked taste for strong drinks. In 2 the pulse was intermittent. In 8 there was found more or less diminution of the red corpuscles. In 12 there were rather frequent epistaxes: 10 had disturbed sleep, and 4 had slight ulcerations of the mucous membrane of the mouth, which disappeared on ceasing from the use of tobacco for some days. In children who were very well nourished, the disorder was, in general, less marked. As to the ages, 8 of the boys were 9 to 12 years old: 19, from 12 to 15. The duration of the habit of smoking was in 11 from 6 months to a year; and in 16 more than two years. The ordinary treatment of anæmia in general produced no effect as long as the smoking was continued; but when this was desisted from, health was soon perfectly restored, if there was no organic disease.—*American Eclectic Med. Review.*

BIBLIOGRAPHICAL NOTICE.

Atlas to the Pathology of the Teeth.—Arranged and explained by the late Prof. Dr. M. Heider and Prof. Dr. C. Wedl, with drawings from nature, by Dr. C. Heitzmann, Part IV. Verlag Von Arthur Felix, Leipzig.

This number completes a very interesting and instructive work on Dental Pathology, and is illustrated by four lithograpic plates representing thirty pathological conditions, with an alphabetical register of the entire volume, Figs. 115 to 145 represent the action of pus upon dentine; absorption of hypertrophied cementum, pathological conditions of gum; deposits of lime in a thickened periosteum of the root; pathological conditions of alveolo-dental periosteum; effect of an abscess on apex of root of an incisor, also on the alveolar process of incisor and bicuspid teeth; salivary calculus; cyst in superior maxillary; transverse section of an epulis; phospor-necrosis of lower jaw; effect of an abscess in the maxillary tuberosity; malignant tumors of lower jaw, with explanations and a list of the plates in both the German and English text.

EDITORIAL DEPARTMENT.

Scarification of the Gums in Dentition.—At a meeting of the "Edinburg Obstetrical Society" Dr. Cairns gave the following views on this subject, which we present in full to our readers, as they appear in the *Edinburg Med. Journal*:

I. Is scarification in dentition productive of any beneficial result? If it is so, in what do it good effects consist? The advantages alleged to accrue from the operation, as contained in the several works which I have consulted, may all be summed up in the following:—first, the relief of local pain; and, second, the prevention and arrestment of convulsions, laryngismus stridulus, diarrhœa, etc., etc.,

1. Scarification, according to its supporters, relieves local pain. Conceding meanwhile that this assertion is true, let us inquire into the grounds on which the assertion rests. Now it certainly cannot rest on the declaration of the little patients on whom the operation is performed because they have not yet acquired the power of speech—a circumstance indeed which renders the treatment of the diseases of children in general of a very difficult and

unsatisfactory nature, preventing them as it does from correctly indicating either the precise seat of their sufferings, or the actual effects of the remedies employed. Well, if the allegation is not, and cannot be founded on the ground I have mentioned, it must in these circumstances be altogether and entirely of an inferential character. Now, the value of inferences is purely determined by the character of the data from which they are drawn. If the data are true, the inferences may be valid or they may not; but if the data are not true, the inferences must, as a matter of course, be utterly worthless. In the present case, then, what are the data from which it is inferred that scarification is productive of relief from pain? These data will, I think, be found on inquiry to consist in the tense, tumid, and congested condition of the gums. The matter stands thus: the gums, in the process of dentition, being in a tense, swolled, and inflamed state, are painful; and by relieving the tension, tumidity, and congestion by means of incisions, you thereby relieve pain. This, I opine, is a correct and fair statement of the case. Well, now, I demur entirely to the alleged fact. that in the *ordinary* process of dentition the gums are either tense or swollen. Is is quite true that there exists over the site of the approaching tooth an evident fullness: but this condition is caused, in all ordinary cases, by the presence of the tooth itself. The tissue overlying the tooth is not put into a state of strain by the tooth as the term tensity would lead one to suppose. No such thing; against such tension nature makes full and ample provision, by causing the subjacent gum to undergo gradual absortion in proportion to the growth of the tooth itself. The tooth is not *pushed* up. it *grows* up; and as *it* increases in growth, so do the overlying tissues become absorbed, thereby rendering tension impossible. Neither is there swelling in the ordinary sense of that term, because nature guards effectually against the infiltration of serum, by causing the growth of the tooth to be sufficiently slow, so as to give the vessels concerned abundant time to accommodate their calibre to the circumstances by which they are surrounded; and if a true swelling does in any case actually form, that is to be regarded simply as an accidental occurrence, and to be treated, of course, as it would be in ordinary circumstances, but it is in no wise essentially connected with the process under consideration. If, therefore, there is neither tension nor tumefaction, scarification is useless as a means of relieving pain, so far as regards the alleged disturbing influences of these two conditions. But what of inflammation? Simply this, that by abstracting blood from an inflammed part, you do not in the least degree either reduce or modify the inflammation. The part continues to be as red, as hot, and as painful as before. Nor do I hold it of much consequence to be told that the child has become more quiet after the operation,

and must therefore have obtained relief by its means; because, unless its advocates are prepared to prove the result to be invariable—which they are not—I am fully entitled, in the circumstances, to assume, that such relief may have followed in spite of the operation, just as many patients have been found to recover from certain diseases in spite of the very questionable treatment to which they may have been subjected.

2. Scarification is alleged to prevent and arrest convulsions, etc.

Now, as a prophylactic remedy, the operation can only admissible under certain conditions:—*1st*, On the ascertained fact, that convulsions are an invariable accompaniment of dentition, *2d*, That the operation uniformly, or at least generally, prevents their occurrence. The question, therefore, is, do these conditions hold? I affirm they do not, and on the following grounds; because convulsions, so far from always coexisting with the process of denti tion, do so in reality in a very small proportion of cases. They constitute, in fact, not the rule, but the exception. And further the object sought has in general not been attained; that is to say, convulsions have just as frequently followed as they have preceded incisions of the gums. So much for the preventive; and as regard the alleged curative agency of scarification, several questions naturally suggest themselves:—

(1.) Does it necessarily follow that dentition is the real exciting cause of the convulsions, merely because the latter happen to be concurrent with the former? Every one, I daresay—even the most zealous advocate of the operation—would unhesitatingly answer in the negative, when the question is put in this pointed and direct manner; nevertheless, I am rather inclined to think that there exists in the minds of most practitioners a strong predisposition to attribute every case of convulsions which occurs in a child within two years old to the so-called cutting of a tooth, and to that alone, unless other causes are so manifest as can hardly escape notice. Nor is the reason of this far to seek; for, in the first place, it is universally admitted by every member of the profession, that dentition may, and does occasionally, induce convulsions; in the second place, there exists a strong tendency in the human mind to connect certain effects with their most commonly received causes, whether true or false, and this circumstance has always operated in a very special manner in the minds of medical men.

(2.) A second question which suggests itself is, Has a recurrence of the convulsive fits, which happen to take place during dentition, always been prevented by scarification? An affirmative answer to this question would justly be held quite conclusive, at least as regards the particular circumstances referred to; but unfortunately, I have not been able to find any one, within the compass of the research which I have made, who ventures to give

the desiderated answer. On the contrary—unlike those who dogmatically proclaim, as an infallible remedy for this and that disease, this and that specific, which no other than themselves have ever been able to verify—even the most strenuous supporters of scarification allege nothing more than simply that after the operation has been performed, the convulsions have ceased to recur only now and again.

(3.) And this brings us to a third question ,viz., Whether, in those cases in which convulsions have ceased after the application of the lancet to the gums, the use of this instrument is to be regarded as the real procuring cause of their arrestment? Now, I do not by any means venture to say that it is not. This were too audacious by à great deal; but I do say, and without the least hesitation, that there exist more abundant data from which to give an answer in the negative than there do from which to give one in the affirmative. What, we ask, are the grounds on which the scarificator is employed? Because, say its advocates, after being applied, convulsions occasionally do not occur. And that is really the only answer which can be given. Very good; but when they are again asked, if they cau affirm with certainty that the use of the lancet has been the actual and sole means of stopping the convulsions, they feel obliged to be somewhat more cautious in the answer which they give. Their reply then is, It may be, or it may not be—we cannot absolutely say which. Well in these circumstances, we must be excused for expressing our humble opinion that the greater probability is, that it has not been so; first because the use of the lancet has just as frequently been followed by the *recurrence* of the convulsions as by their *discontinuance;* second, because their non-recurrence may have been a *mere matter of coincidence and nothing more.* It is well known for example, that in difierent children convulsions differ, both as regards their number and duration. In one child there is often only one convulsive attack, sometimes of short, and sometimes of considerably long duration; in another, we often find two, the one either following the other in close succession, or at a longer interval. Sometimes we find three, and so on; but when they are dependent on dentition, or other local irritation, they always prove of a self-limiting character. Suppose now, that in either of these cases you incise the gums, and that, after doing so, the convulsive attacks cease to return, are you entitled to give the credit to the lancet? If you say yes, I maintain that in the circumstances I am equally entitled to say no; because in all probability the convulsions had entirely ceased before the gums had even been touched by the lancet.

The same arguments which have been employed in the case of convulsions apply equally to the other diseases which I have mentioned as concurring with dentition, and, therefore, I may

pass them over without further notice, merely adding that, although diarrhœa is perhaps one of the most common comitants of dentition, it seems somewhat strange that scarification should be so seldom practised, or even recommended for arresting that most debilitating of all the ailments to which infants are liable.

II. Having considered the beneficial, I now proceed to notice, in the second place, the prejudicial effects of scarification.

1. And here I allege, in the first place, that it is injurious, because it impedes the process of dentition. During the last few days, I have asked several professional brethern with whom I have come in contact, who approve of the operation in question, for what reason they do so? and the gist of the answer which I have received from each has been this: "Because," say they, "the lancet does at one stroke what nature would require a considerable time to accomplish to let the tooth through." And this quite accords with what we find in some of the books. Now, we aver the opposite. We aver that the use of the lancet, instead of rendering dentition more easy, makes it in reality more difficult. And here we must observe, that, in scarifying the gum, three different modes have been recommended—1*st*, by making a single incision; 2*d*, by making a crucial incision; and 3*d*, by making an elliptical incision, and removing that portion of the gum which overlies the tooth. Well, if either of the first two methods is adopted, in nine cases out of ten you have speedy reunion of the lips of the wound, thereby leaving matters exactly as they were before. If, as recommended by some, you go on repeating the incisions, you have just the same result following; thus rendering it extremely difficult for us, at least, to perceive how the approach of the tooth can be facilitated in the least degree by these means; while at the same time, the hard cicatrix which has been formed must require longer time to become absorbed as the tooth approaches than the soft natural tissue of the gum. If the wound heals by ulceration,—and by this process it must do so, when the third method is employed,—you do certainly obviate thereby the absorption of the gum, and thus seem to assist nature. But this, after all, is more apparent than real; because absortion is undergone not only in that portion of the gum which lies over the summit of the tooth, but also in the portions towards its sides,—portions, be it observed, which are left altogether untouched. But even although these portions were also removed, the truth of our averment would, in our opinion, be only strengthened thereby; and in this way, because you would thus expose a greater portion of the tooth to atmospheric influence,—premature exposure to which, by the removal of its natural covering, would give a material check to its growth and development. Consider, also, that by the operation, simple though it seem, you give a greater or less shock to the nervous system of the infant,—

and it is universally admitted that an infant at this period is in a state of high susceptibility, that you excite more or less inflammation, thereby increasing the suffering and irritability of the little patient; that you cause the loss of a certain quantity of blood, of which a child is highly intolerent, and particularly those children on whom the operation is performed, being generally of delicate and strumous habits; that you aggravate the painful condition of the gums, thereby rendering sucking a difficult operation, and preventing the infant from obtaining a proper supply of nourishment. Consider we say, these circumstances and the injurious effects which they must necessarily produce on the general constitution, and through it on the growth of the teeth, rendering that process, as they must do, unusually tedious and slow.

2. We allege, in the second place, that it may lead to fatal hæmorrhage. We are not in a position to state how often this result has followed from the operation; but if all the cases which have occurred had been recorded, and were collected, they might be found to amount to no inconsiderable number. At all events, it is well known that such cases have occurrd, and, indeed, it is only very recently that a case of this nature was reported to this Society by one of its members. To this, however it may be objected—1*st*, That in those cases in which the child has died from loss of blood, the incision may have been made too deep; our reply is that the incision is recommended to be made deep, so deep as to reach the tooth. 2*d*, It may be objected, that fatal cases may only have occurred in those children which happened to have the hæmorrhagic diathesis: we answer, that even although this were granted, you cannot discover whether this diathesis is present or not, until you make the incision, when the discovery is too late. 3*d*, It may also be objected, that the risk alluded to occurs so seldom that it need not act as a deterrent; to this we reply that the untoward results under consideration having happened even once or twice, renders it at least possible that it may also occur in the very case in which you are about to operate; and moreover should it do so and should you tell the parents on inquiry that you were aware that such an event might possibly occur, I rather fear that the parents would not hold you altogether blameless in the matter, and that they would bear you a secret grudge ever after.

3. I allege that it tends to perpetuate a custom which, to say the least of it, is of a doubtful character Probably one of the main reasons why the operation is so generally performed is, not in reality from the good effects which are expected to ensue from it, but because it is usually done in such circumstances. Others do it, and, in order not to appear singular or culpable, I must conform to the general practice, whether the issue should prove favorable or the reverse. In this way did the treatment by blis-

tered, bleeding and violent drugging become transmitted from generation to generation,—age after age—, producing, as it is now universally allowed to have done, the most direful results. And in the same way has been handed down the operation in question, which though uncertain and doubtful in its results, continues to be in high favor and general use as a time-honoured custom. On this point, however, we do not enlarge, but proceed, as was proposed, to inquire.

III. If, in the circumstances, scarification is justifiable? We allege that it is not. 1. Because it inflicts unnecessary pain. The objection, observe, is not grounded on the fact that pain simply is caused to the child. Such an objection were absurd; because, although the medical practitioner holds it to be one of his prime functions to relieve pain, in many cases he can only fulfil that function by employing remedies which are themselves of a pain-giving nature. But this is not the question. The question is, am I warranted in employing a remedy which, so far as can be ascertained, does not relieve the pain which it is intended to do, and which remedy is itself painful both in its application and results? I maintain that in these circumstances I am not justified in doing so, and particularly when I remember the effects which scarification on one occasion produced in my own person. For it so happens, that when some years ago, my last wisdom-tooth was making its appearance, the late Professor Miller, at my own urgent request applied the lancet over it, but the result was, that instead of experiencing relief from the operation, it kept me, on the contrary, in a state of the most extreme suffering for days to come; the remedy, in short, having proved a thousand times worse than the disease.

2. It superinduces some of those very conditions which it professes to remedy. I allude in particular to tension, tumefaction, and inflammation, the relief of which, it will be remembered, was alleged as a reason why scarification should be performed. On that occasion, I simply endeavoured to show that the treatment recommended, had no rational grounds on which to rest; I now go a step further, and aver that scarification actually produces these results. Inflammation it must and cannot but excite; because, in virtue of a well-known physiological law, wherever you occasion a breach in living tissue. more or less inflammation results in order to repair the breach which has been made. Again in an inflamed part there is always more or less swelling, owing to the pressure upon the veins, which causes the exudation of serum into the surrounding cellular tissue. And, lastly, there is tension; because whether the scarified part heals by the first or second intention, there is in either case, contraction of the tissue, and consequent tension, if an unyielding structure like the tooth lies underneath.

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ARTICLE I.

Paradoxes in Dentistry.

By Professor Austen.

Truth is often made forcible by presentation in the seemingly contradictory form of the paradox. We shall thus present an important point, in connection with the adaptation of the Base Plate, which is often disregarded and perhaps as often, either not known, or not acknowledged.

It often happens that, of several plates for the same mouth the *most* perfect fit is the *least* accurate. In illustration of which, take one case of swaged plate and one case of rubber plate.

In the latter case—greatest care is taken to have the plaster impression perfect and the model without a defect; and yet the piece, made with every precaution drops under use and fails to give satisfaction. An old fogey rival who knows perhaps little about "these new fangled plaster impressions," takes an old fashioned wax impression (possibly none of the best) and his piece fits perfectly, to the great detriment of modern dentistry, and the college trained D.D.S.

In the former case—we make our dies, with such regard to their composition, as shall prevent any possible shrinkage

of the metal; and the use of such a number, as shall insure to the plate the full size and exact shape of the model. Agan we fail; and our rival, using the old-timed zinc die, (and one only) succeeds to our grevious discomfiture. Such failures are traceable to causes which it may be profitable to look into.

First, the tendency to abandon old methods and materials. Wax, plaster, and gutta percha are each indispensible as impression materials, and he greatly cripples his resources who uses either exclusively. Each takes a different kind of impression, most useful in its own class of cases—wax, the oldest, equally as useful as gutta percha, the latest; and both adapted to a large number of cases, for which plaster, apparently the most accurate of all, is unsuited. Old fashioned zinc not only must not be set aside, because of its contraction; but, for this very reason, is in many cases to be selected. The discovery of new materials does not render old ones useless, but makes it necessary to discriminate the cases which call for one over the other. This leads to the consideration of the

Second, and most fruitful source of failure—*routine practice*. By this we mean the more or less exclusive adoption of materials or operations, without sufficient inquiry into the special requirements of the case in hand and without full knowledge of the various resources of dentitsry as adapted thereto. Hence, one will use no impression material but wax, another only plaster, and neither will touch gutta-percha. This one uses zinc and lead, that one only fusible metal, whilst the third prides himself upon the scientific combination of fusible metal dies with type-metal counters. Dr. A. scorns anything but a gold plate; Dr. B. thinks rubber meets all demands; Dr. C. has faith in the old tin base; and Dr. D. hopes much from aluminum, as superseding all other materials.

This tendency to run unthinkingly in one groove, whether of one's own or another's making, is fatal to progress. However much practice may develop the utility of any one ma-

terial, it can never compensate the advantage of having several, each supplying the deficiencies of the others.

The force required in the use of wax, gives an impression of the mucous membrane in such state of compression as is absolutely necessary in certain cases; hence, in all such, the failure of plaster for rubber work. Again, the fine lines of a plaster impression are faithfully copied in rubber; but they are of no value for a swaged plate, yet plaster may be the best for other reasons.

Gutta perchà, for general use, has an objectionable contraction (which, however, may be reasonably controlled); yet this very contraction, in connection with the minute detail of its lines, makes it a most valuable material for rubber work, in lower and full-upper cases.

The contraction of zinc injures the theoretical accuracy of a plate, but often greatly improves its practical efficacy. This contraction we may lessen by a plaster impression, or we may increase it by a gutta percha impression. In case *no* contraction is admissible, and a swaged plate is used, recourse is had to dies which have less contraction than zinc. Tin has less, type-metal still less and that of fusible metal is almost inappreciable. These are all useful in their place, but no system of swaging is perfect, which fails to recognize the distinctive advantages of zinc, due to the very property, which is often urged as an argument against its use. If this be understood, then experiments in metals, which shall give greatest hardness with least contraction, become very instructive and useful.

The character of the mucous membrane, in the special case in hand, is habitually disregarded. Yet upon it mainly depends the selection of the impression material. The selection is also dependent on the kind of base plate. Hence, whatever evidence of perfection an impression may give to the eye; judgement cannot be passed until the practical firmness of its adaptation has tested, not only the general accuracy of the manipulation, but the suitableness of the material selected.

The principles of true science teach a wise selection from abundant resources. We may reasonably hope that this will characterize dental mechanism when the skilled mechanician ceases to be the mere instrument of the unthinking or less informed dental surgeon. By which we mean to say, that he who meets the patient must be thoroughly familiar with the relative merits and qualities of laboratory material; or he who does the work should have opportunity to decide upon the appropriateness of their selection.

Dental surgery and dental mechanism may both be practiced by the same person, or each in its own completeness by one person. But to practice all of the first and part of the second, in the way it is usually done, gives none of the advantages which accrue from the pursuit of a specialty, and renders impossible that adaptation of varied resources to particular cases which characterizes the perfect mechanician. Good dental surgeons are rare, good dental mechanicians are still more rare; may not one reason be found in this unwise division of the mechanician's duties.

We propose in the next paper to illustrate another dental paradox, to wit; that the greatest improvement in modern dentistry has proved its greatest curse. Vulcanite has added vastly to the resources of the dental mechanician; but it were better, as matters now stand, had this material never passed beyond the limit of combs, buttons, *et id omne genus.*

ARTICLE II.

An Introductory Lecture on Anatomy.

By E. Lloyd Howard, M.D.,

Professor of Anatomy in the Baltimore College of Dental Surgery.

(Delivered to the Class of the Baltimore College of Dental Surgery.)

In commencing the study of any branch of science, it is well to take a broad and general view of its relations, and to clearly define its outlines, before entering into an examination of its various details.

In beginning the study of anatomy then, before proceeding to investigate the structure of the human organism and its component organs, let us first try to get a clear conception of what organs and organisms are, and of their relations to inorganic nature.

The first great division we make in the classification of natural objects, is into living and inanimate; and inasmuch as we find that life is never manifested except in connection with matter built up in a certain definite structure, or *organized* matter, we apply the term *organic* to living nature and *inorganic* to dead nature. The term *organism* is used to denote that combination of parts which constitutes an individual living thing—whether animal or vegetal. An *organ* is one of the constituent parts of the organism. Thus the human body is an *organism;* the brain, the heart, the liver, the muscles, etc., are the organs of which it is composed.

Anatomy is that science which treats of the structure of the organism and its organs.

Anatomy is commonly divided into Descriptive, Comparative, General and Microscopical Anatomy,

Descriptive human anatomy is the branch to which your attention will chiefly be directed here, but before doing so, let us take a brief survey of the field of comparative anatomy; for there is a grand unity in the creation, and man occupies a peculiar relation to other animals which should not be lost sight of.

In the first place let us look a little more closely into the differences between organic and inorganic nature. The chief point of difference is to be found in the manner of growth; for inorganic matter may be said to grow. The crystal grows, it does more; it grows in a definite manner and form. The various faces and angles are built up in the most orderly and regular manner, according to a fixed plan, and if by accident or design you break off one of the angles of the growing structure, see how it hastens to repair the injury, concentrating, as it were, its forces at that point, and build-

ing there chiefly, until the angle is restored and the proper form completed. Moreover, crystals seem to have a somewhat definite size like organisms, a limitation of growth, after which is reached is ceases to grow, but from the remaining material new growths start into existence. Now what is it that gives to each crystal its peculiar shape? Why does one substance take the form of a cube, another of a rhomb, a third of a pyramid? Surely it seems that there is some inherent directive agency here! We call it polarity, but what its essential nature is we know not. It probably depends in great part upon the shape of the atoms—the bricks of which the structure is composed.

But there is one thing about this growth which we must not lose sight of. It is, that the growth is by a system of aggregation. A particle of some foreign matter, as a speck of dust, may be the nucleus about which the process of crystallization begins; upon this the crystal starts, and then growth takes place by the simple deposition of fresh matter layer upon layer, just as you would build a wall with bricks.

Now let us turn to the growth of organized matter, what do we find?

In the first place no foreign matter can here serve as the foundation for our structure; this foundation, *nucleus*, must have come from some pre-existing organism of a type similar to that about to be formed; and the nucleus itself must be organic and living. We have no example of spontaneous generation. It is true the discussion is still being carried on, but at present, the weight of evidence is upon the side of the doctrine that every living thing is descended from a similar pre-existing organism.

The starting point then for each plant and animal must be itself a living thing. When and how the first germ of each type came into existence, science can not tell.

In the second place, the mode of growth of the organism is peculiar. Not only like the crystal has it the directive agency, determining its form, but that form is built up in a peculiar way. It is no longer a simple aggregation of par-

ticles—a piling of brick upon brick. The living organism first absorbs within its interior the crude material for the structure, its pabulum—food; and then in some mysterious way, changes this pabulum into another substance, or rather into other substances, which finally become converted into the tissues of the plant or animal.

Now please bear this distinction firmly in your minds for *it* is the most fundamental one. *The inorganic* grows by simple additions of material to its surface. *The organic*, by first absorbing, then assimilating, and then adding the newly formed material to its structure *from within*.

In the lower organisms this process of growth is comparatively simple. Each part of the plant or animal seems endowed with the same powers and functions of the whole. The structure of such organisms is but a granular mass, like a lump of jelly; its food is absorbed by any part of the surface with which it may come into contact; then permeates the structure and becomes assimilated. You may divide with a knife such an organism into two, four, twenty, or any number of parts, and each continues to grow just like the one from which they were separated.

But as we ascend in the scale of life, the organism becomes more complex. Then we find one portion of the individual set apart for the performance of one function, and another for another, and difference of function implies difference of structure. So the scale ascends until we find the individual organism to be composed of several organs, each doing its own work, as in the plant, the roots to absorb the pabulum or food; the vessels to elaborate and diffuse it throughout the system, and the leaves to respire. So finally we get to the animal with still greater number and complexity of organs; the stomach to receive and digest the food; the vessels and heart to absorb and diffuse the fresh material to all parts of the system; the respiratory apparatus to aid in the physical and chemical process necessary to life; the muscular system to give the power of motion; the nervous system to preserve harmony in all the various parts, and to

bring the animal into sentient relations with the external world; and, finally, the organs of excretion to remove the worn out material from the system.

We have thus far been speaking of organisms generally, including both the animal and vegetal; the two great kingdoms into which all living things are divided.

Now, although the distinction between animal and vegetal is commonly easy and broad, and we find no difficulty in defining the horse an animal, and the oak a vegetal, yet in their lower orders it is often very hard to say where they properly belong; and there are still not a few which naturalists are unable to properly classify as vegetal or animal. Thus there are animals incapable of voluntary movement to greater extent apparently than some plants; and plants apparently more sensitive than some animals. Neither does the distinction of stomach hold good in all cases, for there are many animals without a stomach proper, and some plants with it. In fact it has been impossible to find any one point as distinctive between the two kingdoms; they so interdigitate that it is only by an aggregate of several characteristics that an organism can be classed in its appropriate kingdom.

Having thus briefly indicated the chief distinctive features between organic and inorganic nature; and between the vegetal and animal, into which the former is naturally divided; let us look a little more closely at man's position and relations in the animal kingdom.

A superficial glance shows many thousands of different classes and varieties of animals; and we are chiefly impressed at such a view with the fact of this great variety. But when we come to look more closely into the matter, we find underlying these, as it were, great similarities, particularly in the internal structure of animals. Many eminent naturalists have devoted themselves to the study of these similarities, and the result has been, that they have been enabled to classify the entire animal creation with a remarkable simplicity and accuracy.

It has been found that all known animals are naturally

divided into four great groups; each group being formed upon a separate and distinct plan, and every animal of each group being strictly conformable to that plan.

These four plans or typical forms are, the Radiate, the Mollusk, the Articulate and the Vertebrate.

In the Radiates, as the name implies, the parts are all arranged around a common centre, from which they diverge like the spokes of a wheel. Take as an example this five-rayed starfish. In the centre is the mouth, immediately beneath this is placed the stomach, sending prolongations into each of the rays, around the mouth is a collar of nerve structure, also sending branches into the rays. On this plan although with great modifications, are constructed the Sea-Urchins, Jelly-fishes, Corals and many others.

The second plan embracing Mollusks, is that expressed in the organization of such animals as the Oyster, Snail, etc. This differs from the plan of the Radiates chiefly in this; that every thing is symmetrical on the sides of the body along the longitudinal axis, at one end of which is the mouth. There is greater complexity and differentiation of parts in this type than in the Radiata and it is regarded as indicating a higher grade of life. Now, at first sight, there appears no great similarity of structure in the oyster and snail, yet by a careful dissection it can easily be proven, that they are both formed according to the same plan, the only difference being in the details of the building, and not in the fundamental parts of the structure.

The third plan, the Articulate, has as its most prominent representatives, insects, beetles, crabs, lobsters and worms. The peculiarities of this group are these; They are composed of a number of rings, more or less closely joined together; running through them all is the alimentary canal; within the rings, also, are contained the nervous system, and the heart and circulatory organs; on the sides are the respiratory organs; the limbs, when legs, are on the lower sides of the rings, when wings on the upper. In this group as in the others, there are apparently great dissimilarities—as

between the bee and the worm, and the crab, yet, if time allowed, I could show you that they are all constructed upon essentially the same principal.

In the fourth group, the Vertebrates,—embracing Fishes, Reptiles, Birds and Mammals, and at the head of which is man—we find the essential peculiarity to be, that they have a *backbone*, in virtue of which they have a double structure —a double symmetry.

The backbone is composed of a number of pieces joined together end to end, but unlike the articulates which have simple rings thus joined, the vetebrates have a series of *double* rings. Let me try to illustrate this.

Here you see we have an upper arch, the spine, and a lower arch, the ribs, forming two cavities along the length of the animal. In the upper cavity are contained the sensitive organs, the great nerve centres of animal life. In the lower canal are the organs of digestion, circulation, respiration, etc. Surrounding these two bony rings, are the principal muscles and tegmentary coverings. This double symmetry is the same in all Vertebrated animals from fishes to man.

The outlines of these four groups into which animals are naturally divided, have been very hastily, and I fear at many points dimly drawn. To do justice to the subject would require many lectures, rather than a mere portion of one. But if you have caught the general idea, I have endeavored to convey of animal classification, it will suffice for the present. The details you must fill up hereafter.

Remember then that all the animal creation may be resolved into four typical forms of structure,—the Radiate, the Mollusk, the Articulate and the Vertebrate,—the names of each group pretty clearly indicating the structure, except Mollusk,which is derived from " Mollis," soft, and describes a property which is also common to some Radiates. Upon one of these four plans every animal is built. The structure of the various orders of a group differ, but it is simply a *variation*, not an essentially different structure. Impressed

by these similarities, naturalists have for a long time been trying to demonstrate the unity of the animal creation in a linear series, and to show a regular gradation from the lowest to the highest forms of life It has hitherto been impossible to construct this hypothetical chain, and probably will continue so, but some late views by Mr. Darwin, bearing upon this subject, are so full of interest and have made such a stir in the scientific world that I cannot refrain from here briefly calling your attentiȯn to them.

In accounting for this mixture of similarities and dissimilarities in the organic world, Mr. Darwin dwells strongly on these two factors: In the first place the organism inherits the features of its parents. In the second place, the offspring differs in some features from the parents, which difference may be transmitted to a third generation. Thus you see there are two opposite tendencies in every newly created organism, the one tending to keep it in a straight line, as it were, the other tending to divert it from this line. Let other factors now be brought to bear, as difference of climate etc. and you can readily imagine that in the millions of births, and during probably millions of years, these struggles with opposite tendencies might have twisted the original image into many different varieties. This we see, to some extent now taking place. Notice for instance, the vast differences which can be produced in certain plants and vegetables by cultivation! See the great differences in horses, sheep and other of our domestic animals produced by a judicious breeding. Take, for example the dog, what great differences between the Newfoundland, the pointer the bull-dog and the terrier, and yet all of these are descended from the same stock! If these changes occur under our sight, what greater changes can occur in the lapse of thousands of years! And so Mr. Darwin thinks that by natural causes operating upon plants and animals, most, if not all of the different species have been formed from a few, if not one, original type. I cannot follow this part of the subject further, but you will find it worthy of your attention, when you have less of the

immediately practical to deal with than you have now.

Leaving the three inferior groups let us look a little more closely at the vertebrate skeleton.

We have seen that all vertebrated animals are constructed upon the plan of a series of essentially similar segments, succeeding each other in the axis of the body. In regarding the varieties of this plan it is well to have a standard with which to compare them, and I here present to you what is called a *typical vertebra*, not that you will find such a vertebra actually existing in any animal, for as all animals are variations from the type, you will find their skeletons more or less differing from the pattern. This piece marked C. is intended to represent the body of the vertebra, above and below we have the two rings or arches N. and H. The upper ring N. or neural arch, represents the spinal canal, containing the nerve centres of the spinal cord. The lower ring, H., or haemal arch, represents the cavity in which are contained the organs of digestion, circulation, respiration, etc. Around this framework of double rings are placed the principal muscles and the tegmentary covering.

A series of such structures joined together in the same straight line gives the simplest idea of a typical vertebrate skeleton.

Each of the classes of vertebrates, Fishes, Reptiles, Birds, and Mammals has its peculiar modification of this plan, and so their respective sub-classes have their respective sub-modifications. We will not further consider any of these but the mammalian.

This figure represents a typical mammalian vertebra, which you see is essentially the same thing as the archetype.

You see the spinal canal has become much lessened in proportion to the haemal canal, notice too the process jutting out from the neural arch. But in spite of these changes, you must recognize that the fundamental characters are unaltered. Now I have said that a series of such segments joined together so as to form two hollow cylinders gives the idea of a vertebrate skeleton and that all such skeletons

can be reduced to this simple form. But you may say, yes, I can conceive such a skeleton for an animal, but it supposes that the animal is like a snake without a head, and without limbs, how do you account for these developments which most all vertebrates have? Well in answer to that question, I must tell you that the bones of the head are but modified vertebræ, and that the limbs are but offshoots from them. Had we the time to enter fully into the question, I could clearly demonstrate this to you, I could prove to you that the fin of a fish is homologous to the arm of a man, by which I mean that they are essentially the same thing, and bear similar relations to the vertebræ of which they are offshoots, they are constructed upon the same plan, the parts of which they are composed are combined in the same way and almost in the same number.

To recapitulate briefly what we have gone over:

In the first place we have seen that living things differ from inanimate nature chiefly in their mode of growth and development. That organic nature is divided into two great kingdoms—the vegetal and animal. That the animal again is divided into four elementary groups, each group being sub-divided into classes, species, and varieties. That the highest of the elementary groups is the vertebrate. That the highest class of vertebrates is the mammal, and the highest order of mammals is man.

We find man then at the head of created beings according to his physical structure; of course when you take into consideration his intellectual and moral qualites he is immeasureably above all. To examine his structure is the object of anatomy, and in the study of the various organs of which he is composed; their mutual relation and dependence; the most admirable adjustments of means to the end you will find a subject well worthy of your closest attention and if rightly pursued, filled with the most interesting of facts. Anatomy is the very groundwork of your science and art. Without clear ideas of the structure of the tissues how can you expect to work properly upon them? And do not

think it will only be necessary for you to pay attention to those organs and tissues with which your art has chiefly to do, for you must remember, that the different organs are so connected, and have such close sympathies with each other that some knowledge of all is necessary to rightly understand the workings of any one.

Moreover, it is proper, that, in aspiring to the high honors which your speciality of the science of Medicine and Surgery may confer upon you, you should be cultivated in this branch about which all scientific men are supposed to have some knowledge.

ARTICLE III.

Notes on the Detection of Hydrocyanic Acid, in Medico-Legal Cases,

By M. J. DeRosset, M. D.,

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It is a fact worthy of note, that in many of the "causes celebres," the history of which is preserved in the annals of forensic medicine, where the question of the guilt hinges upon the chemical evidence, attempts have been made to invalidate the testimony of the analyst, often upon the most insubstantial pretext. The plan usually adopted by the ingenious counsel is not to attack the general method of the analysis, but by studying carefully the evidence, and by measuring every step, to seize upon any omission, however trivial, as the key note to the tone of his argument.

The neglect of some minor element in the process is most often the chief factor in lessening the force of the testimony although an over-abundance of manipulation is occasionally instrumental in introducing weak links into the chain. These, therefore, omission and redundancy are the Syclla and Charybdis through which the chemist must pass, and it is important to look well to the possible dangers on either side, if he would keep within the limits of safety, and obtain

results so clear that none may withstand the force of their logic.

A strict regard for the honor of the science, no less than for the individual credit, should cause the same careful conservatism to be carried into the witness box that has been employed in the research. And as it is essential to avoid hasty deductions in the laboratory, so it is well in testifying to permit no extraneous matter, brought to light during the trial, to mould or alter one form or figure of the conclusions to which the results of the analysis, alone considered, have led.

It is of the highest import to know whether the poison found be a constant or occasional constituent of the body, and whether it may be formed as a result of post-mortem changes. These are questions to which the chemist may rightly be called on to give definite replies, and his information in this direction should be of the most positive character. His office, in a word, is to instruct the judge and jury as to matters of fact, but beyond this "*Vir sapit qui pauca loquitur.*" Speculations as to the relations between the chemical facts and the remaining testimony form no part of the chemist's duty; the calculation of these probabilities belongs to others, and he is wise who declines to be led away by the counsel from the clear summary which his experiments have developed.

If the usual tests give no evidence of poison, it is the duty of the chemist to testify that none was present, although the strongest chain of evidence seems to point to one. When it is a question of fixed poisons, as arsenic or the alkaloids, which do not readily undergo change, then a failure to elicit the characteristic reactions is a certain evidence of the non-presence of them; but if discovered they are always to be connected with the ante-mortem circumstances, since there is no possibility that any one of them shall be generated by the living or dead body, or from its substance by any process of analysis.

The case differs somewhat for gaseous and volatile poisons of organic origin, as hydrocyanic acid, cyanogen, and even the poisonous cyanides. If the nature of the poison be unknown, these volatile ones should be first sought after, the simplest methods being preferred, at first tentatively, and afterwards for full corroboration.

It must not be forgotton that *cyanogen compounds are not infrequently found among the products of the natural decomposition of animal tissues; further, the identical composition of urea and cyanate of ammonia is to be remembered; and that the destructive distillation of uric acid gives rise to cyanic and hydrocyanic acids.* These are possible sources of traces of the poison, and together with the *sulpho-cyanogen of the saliva* are to be considered *quoad* their value in the final conclusions. In view of these facts the deductions must be drawn with the greatest care. If but faint traces are obtained it must be so stated, and, in conjunction therewith, all the possible conditions under which such traces might be exhibited should be carefully and fully detailed, but whatever connection any one of them may bear to the general evidence must be left to be declared by the court.

With the chemist it is solely a question of the presence or absence of poison, and whether or not death ensued therefrom, but *under no circumstances is he justified* in forming and expressing a belief in the guilt or innocence of the accused.

The great volatility of the poison renders it important that the analysis be made speedily, and once uudertaken, it must be conducted through to its completion without interruption. If putrefaction has commenced, any hydrodcyanic acid present will be in the form of a cyanide or sulphocyanide of ammonium, which may be dissolved out by alcohol, the mixture if alkaline or neutral being acidified with tartaric acid, and the whole distilled at a low temperature (178° F.). The tests for the vapor are to be applied to the distillate; and here it may be stated that it is not within the power of

the analyst to discriminate between hydrocyanic acid and any cyanide, the reactions in each being due only to the cyanogen.

Let us examine briefly the various tests and the fallacies into which they may lead us.

The nitrate of silver test is very available, exceedingly delicate in its results, but the white cyanide of silver which forms, if cyanogen is present, may be confounded with the white chloride of the same metal which would result from the presence of hydrochloric acid. The distinction between these two salts is sufficiently characteristic, with appreciable quantities, but the delicacy of the test will also exhibit such minute quantities of either as to render it impracticable to distinguish between the two. Nevertheless the test should always be used, at least as an exploratory one; if it gives traces of a white silver salt, although too small to be further dealt with, hydrocyanic acid may be suspected, and proven by Scheele's and Liebig's methods. If sufficient traces are obtained there is the further inestimable advantage of the characteristic cyanogen flame which may be had from the cyanide of silver.

Schoenbein has lately suggested a new method for detecting minute traces of hydrocyanic acid. It is useful for exploratory purposes but is of no value whatever in fixing a crime. It is as follows:

Unsized (filtering paper) paper is soaked in a tincture of guaiacum, containing 3 per cent. of the resin, and dried. When to be used it is moistened with a solution of sulphate of copper, of the strength of one or two grains to the ounce, when if brough into contact with the vapor of hydrocyanic acid instantly it is rendered blue, It is said that one drop of the acid in 4000 ounces of water may be detected by this test. But in addition to its being valueless in medico-legal cases, it is open to the still further objection of exhibiting a similar blue color in ammonia vapor, from the formation of ammonio sulphate of copper. The main corroborating tests are Scheele's and Liebig's.

Scheele's test.—Caustic potash and hydrocyanic acid in presence of each other unite to form the white cyanide of potassium; a mixture of a ferrous and a ferric salt added to this yields a permanent blue precipitate, the ferrocyanide of iron (Prussian blue).

But a bluish precipitate is also the result of mixing these salts of iron with caustic potash when *no* hydrocyanic acid is present, the hydrated ferric oxide being formed, and the test would be inconclusive if arrested at this stage; so hydrochloric acid is added in slight excess which causes the ferric oxide to dissolve, but the Prussian blue remains, if any was present, and must be taken as a proof of the presence of hy drocyanic acid.

The chances of error are two fold.

First the Prussian blue does not always form immediately if the quantity of the poison be small, but requires often an hour or two for its appearance; and hence we may conclude too hastily that no poison is present, when a longer lapse of time would have demonstrated it.

Secondly, The precipitated ferric oxide may be mistaken for Prussian blue, especially if any remain after an insufficient addition of hydrochloric acid, and thus we may believe that we have detected the poison even when none was present.

Liebig's test is exceedingly delicate and conclusive, and offers but two chances of error, and these remote ones.

First, if the sulphydrate of ammonium is not evaporated to dryness, a black sulphide of iron is apt to form on the addition of a ferric salt, and thus mask the red sulpo-cyanide of iron.

Again the sulpho-cyanide of iron may be confounded with the acetate or the meconate of iron, both of these salts being red; so the test should always terminate with the addition of corrosive sublimate which bleaches the sulpho-cyanide, but does not effect either the acetate or meconate of iron. It is proper to add that neither of these latter substances are

apt to be present, yet the possibility calls for the proper discriminating test.

A few words in conclusion respecting the chances for the detection of this poison after death. If death has been sudden from a large dose it may be detected for a notable period thereafter; in one instance where two or three drachms had been swallowed traces of it were obtained three weeks after burial. But this is unusual. If death was gradual, it will certainly not be readily detected, and especially we may not expect to find it in the *stomach more easily than elsewhere, for, being so diffusible, it would speedily disappear from that viscus during life.*

It is, therefore, in such cases quite as important to select other portions of the body for analysis as that organ, and if there be choice of any it will most probably, if the conjecture may be hazarded, lie in the great nerve centres upon which the whole violence of this subtle poison is expended, destroying life as if by a blow, not simply, we may say, by creating some mysterious vital impress there, but, in a more intelligible way, by satisfying its powerful affinities from among the physiological elements of nerve structure.

ARTICLE IV.

Fibrin, and its relation to the Blood and the Tissues.

At a meeting of the "Baltimore Medical Association" Prof. Henry R. Noel of the Baltimore College of Dental Surgery, gave the following views in regard to fibrin in the blood, the subject under discussion being the "Causes of Sudden Death."

I. That fibrin is the "formed material" of the "germinal matter" of Dr. L. S. Beale, and is, therefore, to be placed in the histogenetic, rather than the histolytic class.

II. That when found in the blood, it is to be considered as a product of the white blood corpuscle, except in case of disease, when it may be found in the tissue, and absorbed into the blood vessels.

III. That whether found in the blood current, or in tissues, and absorbed into the blood current, it is in each and every instance an *abortion*, and marks a degree of lowered vitality of the germinal matter of the tissue, or of the blood. The "germinal matter" in the blood, i. e. the white blood corpuscles, fails to develope normally into the red corpuscles, but *aborts*, and gives fibrin as the product of this abortion.

IV. That the germinal matter of the tissues, and especially the connective tissue corpuscles of Virchow, (which are only masses of germinal matter,) often exhibit a like abortive effect at development, and that in this instance also, the fibrin arises as the product of the abortion.

V. That there is no such thing as a fibrinous exudation from the blood into the tissues, but the fibrin may be, and often is, found in the tissues, and then absorbed into the blood.

VI. That whether found in blood or tissue primarily, it must sooner or later be oxidised and carried off as urea, carbonic acid, &c.; that being a product of abortive histogenesis, it could subserve no useful purpose in the economy save the chemical one of producing heat.

VII. That in inflammation, such as the phlegmons, pneumonias, &c., the fibrin of the buffy coat was formed principally in the tissues diseased, and not in the blood; that being formed locally in the tissue diseased, it was by osmotic action taken by the lymphatics in the blood current.

VIII. That being taken into the blood, it is, in reality, a foreign element, and must be at once disposed of; that this can only be done by oxidation, and the rapid oxidation of the fibrin is one source of the heat in the fevers which mark these phlegmasiæ.

IX. That in the inflammatory process the first step is the local formation of fibrin; the second is its absorption by the lymphatics; the third is its oxidation in the blood; the fourth is its elimination by the urinary organs as urea, uric acid, &c.; that the increased respiration and increased circulation are necessary to supply the increased demand for

oxygen; the heat is the necessary consequence of the increased oxidation.

X. That as long as the local production can be removed by the local lymphatics, and this fibrin oxidised in the blood and excreted by the kidney, there will be no local accumulation; but should there be deficient oxidation, or deficient action of lymphatics, there will be a local accumulation at the point of formation, and this fibrin then and there coagulating will give us the hepatization of pneumonia and phlegmons.

XI. That fibrin in the blood cannot, therefore, be considered a normal or physiological element of the blood, but an abnormal or pathological one; that its presence in blood or tissue tells a history of arrested development, with abortive histogenesis; that the amount present is the accurate measure of pathological change, or the degree of aberration from the true physiological condition.

Physiological blood should have no fibrin.

XII. That, therefore, before we investigate embolism as a cause of sudden death, it would be but just to investigate the action of those causes which devitalise the germinal matter of blood and tissue, and lead to the production of that abnormal element, fibrin, the coagulation of which in the heart, Dr. Richardson thinks, is so frequent a cause of death. Coagula are found in the heart after death, from nearly every cause, save lightning; and it was a mooted question whether the fibrin was not formed *during dissolution*, and after *somatic*, but *before molecular death*. The clot, in blood drawn from the body, shows the fibrin and white corpuscles inversely proportional, and is not, therefore the fibrin formed from these, and if so, may it not be formed during and after the drawing of the blood, and be in fact the result of the changed and abnormal relations of blood, vessels, and atmosphere?

ARTICLE V.

Manufacturing Instruments.

By A STUDENT.

In manufacturing excavators, I first obtain the very best material that can be procured at the depots, (Blake & Co). I then forge one end to the size desired, taking care to cause no flaws in the steel, which is quite easily avoided by striking it alternately, that is on one side then on the other, or, which is much better, draw one side out at a time, and by so applying heat each time I can avoid having those flaws, which cause the steel to be worthless. After I have the steel very nearly the size desired, I use a file, which removes all indentations of the hammer, first a course and then a fine file, and so on until smooth. However, after you once become an expert in forging, you will not need a file unless you desire the part forged to be round. Now, being ready to shape according to the pattern desired, I am very careful not to bend while the steel is cold, as it may be tempered from forging to that point which will cause it to be brittle and break. Although when annealed it can be bent to any degree you may wish it is always best to be on the safe side; heat to a *dark red* each time you bend it. Being now ready to temper, I apply such a degree of heat to the end of the instrument as will cause it to become a *cherry red*, and then plunge it into a hard ball of wax. I can not say what temper it is, but this I know, the edge or point is of sufficient hardness to retain a good edge, so as to cleave down the hard tissues of the teeth, and the shank of sufficient hardness to preserve its shape when pressure is applied. Yet if I wish to bend so as to facilitate working or excavating a cavity, I can without fear of breaking, and also return it to the former shape. To sharpen an excavator use an oil stone, or, which is better, an Arkansas stone; after which I polish, by first removing all marks of the file with different grades of emory sticks. These can not be procured at the depots but can be made out of emory paper. I also have another stick, say 8 or 10 inches long by 1 wide, with

leather glued upon two of the sides, one side of which contains *crocus*, the other powdered emory with a little sweet oil, using the emory side first, until I have as smooth a surface as can be obtained, afterwards the *crocus* which gives a beautiful polish; or, instead of using the *crocus*, use a burnisher, which will also give a high polish.

The pluggers are shaped in the same manner as the excavators, after which they are ready to serrate, the thickness depending upon the number of serrations desired, and the end being smooth so that the serrations are all of one length, using a file intended for this purpose (serrating). I rub the end of the instrument upon this file, holding it at the same time a little oblique, which is perpendicular with the rows of teeth on the file, until I have small teeth cut upon the end. The direction rubbed must be the same as the rows or teeth on the file; these teeth are never made perfect by this process but must be sharpened, this is done by a small and fine triangular file. This file may be made to have a very fine angle by grinding the one side off, which will enable you to pass between and file the finest serrations. Such work as this requires excellent eyes, but a small hand microscope will faciliitate the operation very much. These teeth are required to be sharp and smooth so as not to contain any rough and irregular edges, as the gold will hang to them and prevent you from working with any facility. To make these serrations smooth I use a triangular slip of Arkansas stone, which I sharpen whenever it becomes dull and blunt, so as to pass between these teeth and make each serration smooth and perfect, which is seen by passing the serrations through writing paper. If the perforations made in the paper be perfect, it will not adhere to the instrument when withdrawn, but if imperfect it will adhere and have fine shreds of paper all about the perforations. After these serrations are perfect the instrument is ready for tempering, which is more difficult than in the case of excavators that are only plunged red hot into hard wax. But the pluggers I first heat sufficient to

melt a small quantity of soap which prevents oxidizing and destroying the properties in the steel when subjected to so high a degree of heat as is necessary. The instrument is then heated to a very light *cherry red* and plunged into water, this will be a glass temper which is entirely too hard and must be reduced. First remove the oxide from the instrument with an emory stick so as to have a smooth and bright surface, that when the heat is applied I can see the different colors conducted down to the point. The flame is brought in contact about one inch from the point, and when the serrations are of a *straw color*, and the shank a *dark blue*, I plunge again in water, this will cause the serrations to be hard enough so as to retain their shape when brought in contact with gold and the hard tissues of the teeth, and will not break; the shank being a dark blue will support all the pressure that is necessary.

Sometimes you may find it difficult in keeping the points or serrations a straw color while the shank is of a dark blue, but if you place the points in a drop of water upon a cold hammer you can retain this color without any trouble. The instrument is now ready for polishing, which is done in the same manner the excavators are.

ARTICLE VI.

Fifteenth Annual Meeting of the American Dental Convention.

The association of Dentists organized in August, 1855, under the name of the AMERICAN DENTAL CONVENTION held its *fifteenth annual meeting*, at Tyler's Hall, New Haven, Conn., on Thursday October 21st, 1869.

The President DR. J. M. CROWELL of Brooklyn, N. Y. called the meeting to order at eleven o'clock A. M.

The Secretary being absent Dr. Samuel Mallet of New Haven, was appointed Secretary pro-tem.

The regular order of business was proceeded with which with discussions on various professional subjects, and the election of officers for ensuing year occupied the time of the morning session.

The election of officers resulted in the choice for President of Dr. J. G. Ambler of New York, for Vice-President Dr. Samuel Mallett of New Haven, for Recording Secretary and Treasurer Dr. J. H. Smith of New Haven, for Corresponding Secretary Dr. J. S. Latimer of New York.

The retiring President made a short address in which he urged upon the members of the profession to use their utmost endeavors to discontinue the use of rubber or vulcanized dental plates which are working so much injury to the health of the public, and to pay more attention to the improvements of a better class of work.

He stated he had of late been studying the merits of Porcelain Base, and was pleased with the improvements made in the style of work; also that the cheapness and ease with which rubber was made, had the tendency to drive out from mechanical dentistry the better class of dentists, but that he hoped now, since it was found that rubber was injurious as a base for artificial dentures, that it would bring back the more skillful dentists to a higher standard in the mechanical department; while we have improved greatly in the operative department, there has been a falling off in artificial work.

The incoming President, Dr. J. G. Ambler of New York, on taking the chair alluded to the remarks which had just been made and stated that instances were numerous in his practice where vulcanized rubber plates injured the health of the wearer. Considered gold and platina far preferable in every respect; thought we ought to perfect instead of cheapen artificial dentures.

Dr. Ambler in his address gave a very pleasant reminiscence of the convention from its birth up to the present time, showing the good which it had done in bringing the dentist that was no operator at all, up to a standard that our best operators of the present day are not ashamed to acknowledge as well worthy the confidence of the public &c., &c.,

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Dr. Preterre of New York was opposed to the use of rub-

ber; he considered the collodion far better for cheap work. He exhibited a number of specimens of collodion and rose pearl, but for durability and nice work he considered gold plates or Allen's continuous gum or platina as the best that could be used.

Dr. Mallett of New York said that he had met with the same difficulties that the preceeding gentleman had with rubber, that it had been a curse to the profession, the cheapness of the work and the ease with which it was made had lowered the dignity of the profession, bringing a class of people into our ranks that were not worthy the name of dentist, who extracted thousands of teeth that might otherwise have been saved. Its use had done a great deal toward introducing the adominable custom of extracting sound teeth, which he regarded as one of the most horrible practices. Nevertheless rubber has been a perfect boon to thousands who could not afford a gold plate, and its utility hinges upon the question whether or no it was a proper article to put in the mouth. He was in favor of gold plate.

Dr. J. H. Smith said that in his practice for full sets he preferred the continuous gum or platina plate, had discarded rubber entirely. For partial pieces, used gold or iridium; had in some iustauces made full sets of iridium plate, baking the Allen siliceous compound the same as platina plate; it made a much stiffer plate and required a little more care in striking up than platina, for it was not as yielding, and when strength was required he preferred it; had had good success in the continuous gum work far less breakage than with rubber. While he made rubber he preferred continuous gum work, and as a general thing the breaking of these sets was from letting them fall while washing over a marble or china basin, thinks its the strongest work made; while in the mouth he said the weight was often made an objection to the continuous gum by dentists using rubber, but he had found no trouble in that way when a good fit was made, had less trouble in getting a good fitting plate than he used to have when he was using rubber, had fre-

quently made the continuous gum work for patients that were wearing rubber plates and to use their own expression, "They fit better and feel lighter than my rubber ones did." Properly made he believed the continuous gum on platina or iridium plates was, all things considered, the very best that he knew of as yet for artificial dentures, &c.

After a lively discussion of this and various other subjects, it was on motion resolved that when we adjourn it be to meet in the city of New York, on the third Tuesday in September, 1870.

The President appointed DR. W. B. HIND of Brooklyn; DR. B. T. WHITNEY of Buffalo; DR. I. J. WETHERBEE of Boston; DR. L. S. STRAW of Newburg and DR. JOHN ALLEN of New York as Executive Committee, and DRS. W. H. ATKINSON, F. H. CLARK, N. W. KINGSLEY of New York; DR. MARVIN of Brooklyn, DR. W. H. MORGAN of Nashville, Dr. W. T. ARRINGTON of Memphis Tenn., DR. F. J. S. GORGAS of Baltimore, DR. M. S. DEAN of Chicago, DR. L. W. ROGERS and C. A. FOSTER of Utica, DR. A. WESTCOTT of Syracuse, DR. C. W. HARVEY of Buffalo, DR. F. FRENCH of Rochester, DRS. JAS. TRUMAN and A. TEES of Philadelphia, DR. H. L. AMBLER of Cleveland Ohio, DR. F. SEARL of Springfield Mass., and DR. RIGGS of Hartford Ct., as Essayists.

On motion adjourned.

J. H. SMITH, *Rec. Secretary.*

SELECTED ARTICLES.

ARTICLE VII.

Gangrenous Stomatitis.

HISTORY OF TWO CASES, WITH REMARKS.

Read before the St Louis Medical Society, by R. S. Anderson, M. D., Demonstrator of Anatomy in the Missouri Medical College.

During the latter half of the month of May, a general epidemic of measles prevailed at the Protestant Orphan Asylum, in this city. About twenty cases occurred, all of which recovered under the usual expectant treatment now

almost universally adopted in this disease. The only sequalæ that followed this epidemic were the two cases of gangrenous stomatitis which I now report.

George Barner, aged 5 years, previously healthy and of seemingly robust constitution, had the measles in an unusually severe form, and did not recover either so completely or so rapidly as the other cases, remaining after the subsidence of the attack in a drowsy, listless condition, with little appetite and severe diarrhœa. The diarrhœa was with some difficulty checked by aperients, followed by astringents, opiates and brandy. Tinc. ferri. chlor, was then freely prescribed, and nutritious food ordered.

About a week after the subsidence of the measles, and after the checking of the diarrhœa, and during the process of general but tardy desquamation of the cuticle, ulcerations were noticed on the mucous membrane of both sides of the mouth, at the point of union of the cheek and gum, opposite the molar teeth of the lower jaw, and partially involving the gum. These ulcerations were at first accompanied by little or no swelling of the tissues of the cheek. There was little or no increase of the salivary secretion. As the ordinary ulcerative stomatitis was then somewhat prevalent in the institution, this was at first supposed to be of that nature, and I think now that the gangrene which followed was grafted upon the ulcerative stomatitis, a fact which, according to Dr. West, seldom occurs. These ulcers were several times thoroughly cauterized with argent. nit., and washes containing chlorate of potash and carbolic acid were alternately and constantly applied locally, and beef-tea, potas. chlor. and iron were ordered freely. Under this treatment the disease rapidly advanced, the cheeks gradually enlarged, became hard and resisting to the touch, and presented externally a diffused red, glistening appearance. The secretion of saliva, which was not at first notably increased, gradually became profuse, the breath fetid, and the molar teeth loose. The ulcers rapidly enlarged at their base, and seemed to be excavating the tissues of the cheek, and were lined

with a dark grayish, tenacious, shreddy slough, adhering closely to the subjacent tissue, and difficult of removal by the forceps. The gangrene did not seem to involve the mucous membrane to the same extent as the tissues beneath. During this time the slough was removed, as far as possible, frequently during the day, and sol. carbolic acid freely applied to the surface of the cavity.

On Saturday morning, June 12, I found the left cheek, near the angle of the mouth, perforated by the gangrene, presenting a dark spot in the redness about the size of the end of a lead pencil. At this time the case was seen with me by Drs. Watters and Drake McDowell, and in the afternoon by Dr. Lemoine.

The next day the gangrenous spot had reached the size of a twenty-five cent piece. Assisted by Dr. Quarles, who administered chloroform, I excised the spot, and thoroughly applied nitric acid to its edges and the cavity within, and also to that on the right side, which had not yet perforated.

Up to about this time there had been but little constitutional disturbance observable, but now fever became constant, presenting evening exacerbations. The appetite was increased and even voracious during the whole time, and at no time did the patient complain of any pain. Brandy was administered freely in combination with the other internal remedies. The application of the acid did not seem to affect in the least the spreading of the gangrene. This rapidly progressed, perforated the other cheek, extended above to the lower eyelids, involving both lips and the upper part of the neck, and was finally arrested by the death of the patient on Sunday, June 20. Death seemed to be caused by constitutional contamination, either secondarily to the local disease, or, as I think more probable, primarily causing the gangrene and being itself aggravated and increased by it.

Bertha Lerch, aged four years, German, had measles at the same time, in a milder form, and followed by more rapid recovery, without desquamation. A similar ulceration was observed at the same time as in the former case, (June 1,)

about one week after recovery. It was situated on the posterior portion of the left upper maxillary, on both sides of the last molar tooth. It was treated in a precisely similar manner as the above, without the application of nitric acid, and seemed after a week to be entirely arrested. The cavity in the cheek was small and had ceased to extend; the slough on its surface had disappeared, and the cavity was covered with pus and granulations; the hard firm swelling of the cheek was softening and subsiding. About the 10th of June the last molar tooth, which was loose and caused pain, was removed under my direction by a dentist. On probing the cavity, I discovered necrosis of the alveolar process of the jaw. I flattered myself that the danger in the case had passed. But on Tuesday, June 15, the swelling was observed to be notably increased. The cheek became red, hard and shiny as before, and, on careful examination, I again discovered the dark slough in the cavity.

On Wednesday morning the swelling was still increased, and the disease appeared to have involved the cavity of the antrum Highmorianum. In consultation with Dr. Steele, we applied the pure carbolic acid thoroughly to the cavity in the cheek. I saw this case no more, as it was then removed to the Good Samaritan Hospital, where its mother was a patient. I have since heard, however that the gangrene rapidly extended, perforated the cheek, and ran a more rapid course than the former case, terminating fatally just one week after the perforation of the cheek. Besides the above named gentlemen, I had the benefit of consultation with Drs. Gregory, Bryson, of the City Hospital, and Kealhofer.

I have seen a similar case to these last week at the City Hospital, and have heard of two others occurring in the city at the same time. All of these also proved rapidly fatal.

These cases are reported on account of the variety of the disease, its extreme severity, its rapid progress, and its resistance to all the therapeutic means employed.

The disease is so rare that Dr. West states that he has

only had the opportunity of witnessing it in 10 cases, in 8 of which the patients died. Rilliet and Barthez notice 21 cases, of which 20 died. And another French observer, M. Tourdes, has collected from different sources 239 cases which, however, did not all occur in children, of which 176 or 75 per cent., terminated fatally. It is stated seldom to occur in an idiopathic form, but is in almost every instance engrafted upon other affections characterised by grave changes in the circulating fluid. In the large majority of cases, measles is reported as the primary cause, though it has also followed typhoid fever, scarlatina, variola, and intermittent and remittent fever. It has sometimes prevailed endemically in some European countries, among the poorer classes. It seems to be peculiarly a disease of hospitals and institutions in which children are collected together in large numbers, under unfavorable hygienic and dietetic conditions. I think its occurrence in these institutions may be explained by the theory that a large number of cases of contagious disease collected together in a small place may intensify the effect in some of the cases; otherwise I cannot explain the occurrence of cancrum oris in this Asylum, where the conditions for health and recovery are infinitely superior to those existing in the houses from which a majority of the children are brought. It has sometimes, undoubtedly, followed the free administration of mercury. In the two cases reported above, none of this drug had been administered.

There is a difference of opinion in regard to the site of the disease in its incipiency, some authors ascribing it to the mucous membrane, and others principally to the internal substance of the cheek. In the cases above, it undoubtedly originated in the mucous membrane. The majority of cases occur in children between the ages of two and five years.

All authorities agree in the general indications of treatment, and recommend stimulants, nutritious diet, and antiseptics. Much stress is laid upon the early and thorough application of caustic acid to arrest the progress of the slough. This, in the cases reported, did not seem to have the least effect.

The disease, therefore, may be considered as originating in a depravement of the nutritive element of the blood, characterized by the production of a local gangrene, which seems in itself to be possessed of active properties, producing destruction of tissue by mere contact. This process of necrosis is explained by Dr. Bennet as consisting, under these circumstances, in the conversion of the carbon of the tissues into carbonic acid, the hydrogen into water, and the azote into ammonia. The disease called noma, which affects the genitals of young female children, seems to be identical in nature.

The indications deducible from this view are, therefore, two fold: The correction of the systemic contamination, and the improvement of the plastic elements of the blood, and the destruction of the infective properties of the slough. That the treatment directed to the fulfillment of these indications failed in these cases is owing, probably, more to the inadequateness of our therapeutic agents, than to error in their selection.—*Med. Archives.*

ARTICLE VIII.

Something New in Working Plaster of Paris.

It is a well known fact that powdered gypsum, when freed by calcination of its water of crystallization, regains to a great extent its original hardness when incorporated with water enough to form a stiff paste. In order to attain this end, there is at least thirty-three per cent. of water required wherefrom twenty-two per cent. is withheld as water of crystallization. The rest evaporates, and thus brings about the porosity of the hardened gypsum. In working up a small quantity of gypsum, one has only a few minutes' time for using the paste for moulding or puttying, as it soon becomes hard. With larger quantities, in which case the making of the paste requires a longer time, the mass hardens, sometimes during the operation of dressing. According to Mr. Puscher, of Nuremburg, this inconvenience may be got rid of by mix-

ing with the dry powdered gypsum from two to four per cent. of finely pulverized althea-root and kneading the intimate mixture to paste with forty per cent. of water. In consequence of the great amount of pectin which is contained in the althea-root, and which in fact amounts to about fifty per cent., a mass similar to fat clay is obtained. This mixture begins to harden only after a lapse of one hour's time. Moreover, when dry it may be filed, cut, twined, bored, and thus become of use in the making of domino-stones, dies, brooches, snuff-boxes, and a variety of other things of similar character. Eight per cent. of althea-root, when mixed with pulverized gypsum, retards the hardening for a still longer time, but increases the tenacity of the mass. The latter may be rolled out on window-glass into thin sheets, which never crack in drying, may be easily detached from the glass, and take on a polish readily upon rubbing them. This material, if incorporated with mineral or other paints, and properly kneaded, gives very fine imitations of marble. They bear coloring also when dry, and can then be made water-proof by polishing and varnishing. The artisan in the practice of his trade, will probably find it to his advantage to make use of this prepared gypsum in place of that usually employed by him; the manufacturer of frames need have no fear that wares will crack if he uses a mixture of the above-indicated composition; moreover, the chemist and chemical manufacturer will find that the same does excellent service in luting vessels of every kind. The exact proportion of water to be made use of cannot be given exactly, as it varies within the range of a few per cent., according to the fineness and purity of the gypsum employed. The above-mentioned althea-root need not be of the very best quatity, the ordinary kind serving the purpose perhaps quite as well. —*Druggists' Circular.*

ARTICLE IX.

Staphyloraphy.

In a report on this subject to the Illinois State Medical Society, Dr. Moses Gunn, of Chicago, gives some interesting statistics. He says:

Prof. Mussey, of Cincinnati, reports four operations, all on the soft palate. In one case, the patient attained perfect articulation; in another there was improvement; two were lost sight of.

Prof. Goldsmith, now of Vermont, reports seven operations, six of which were upon the velum, and one upon the entire palate; there was improvement in speech in five.

Prof. Hodgen, of St. Louis, reports three operations; one on complete fissure, and two on fissure of velum only. In one of the latter two there was decided improvement. In the first case mentioned, an obturator was being fitted at the time of writing.

Prof. Miner, of Buffalo, reports three operations, two for incomplete, and one for complete, fissure. In the latter, an obturator was used. Result—decided improvement in one case.

Prof. Marker, of New York, reports two operations, one of which was for congenital, and one for traumatic, fissure. In the congenital case, there was very slight improvement, while in the traumatic case, there was a perfect restoration of speech. These two cases are especially interesting and instructive, illustrating, as they do, the difference between the recovery of a temporarily lost power and the acquiring of an entirely new art, after maturity, and, at best, with but an imperfect organ.

Prof. Gross writes:—"I do not think that the speech ever improves very greatly after the operation, however successful. This, certainly, has been the result of my own experience, notwithstanding the pains which most of my patients have taken to educate themselves in articulation."

Prof. Parker has operated four times, in all instances, for

fissure of velum only. He writes:—"In each case I was very much disappointed in the result upon articulation. There was no decided improvement. My disapointment was so great as regards improvement in speech that for many years I have refused to operate."

Your reporter can from his own experience enumerate only three successful operations, and honesty compels him to acknowledge that those were of no benefit to speech.

A little reflection on the subject will enable us to see why so small rewards should attend, or rather follow upon, this operation. The operation requires for its performance the cooperation of the patient; this is inconsistent with either an anæsthetic condition or that lack of courage and endurance which, as a general rule, characterizes childhood. Consequently, we are compelled to postpone surgical interference till about the period of dawning maturity. And, now, after a successful operation, at this late period, the poor unfortunate attempts to learn a new and really difficult art, and that, too, with an imperfect apparatus—a machine imperfect in one of its important constituents. The difficulties which attend his efforts, and which he must overcome, may be faintly appreciated when, after maturity, we attempt to articulate a new language, or correct, here and there, in our native tongue, a long-practised habit of incorrect pronunciation. The German, however intellectual by nature or cultivated by study he may be, finds it almost impossible to articulate some of the sounds of our language, as, for instance, the sound of *th*, while the American finds it equally difficult to express correctly the gutterals of the German. Add to these well-known difficulties a habit grown and matured with the individual of misarticulating each and every articulate element of a language; consider, also, that his machinery for articulation, though materially improved by the operation, is still far from perfect; remember how small is the proportion of really tractable or persevering men, and we shall cease to wonder at the small number who, after this operation, ever attain fair powers of articulation.

As a merely surgical procedure, staphyloraphy is a feasable operation; but as to its rewards, a reasonable doubt may yet be entertained.—*Med. & Surg. Reporter.*

ARTICLE X.

Artificial Respiration.

By Sumner Rhoades, M.D.,

Of Lowville, N. Y.

Marshall Hall directs the patient to be rolled sixteen times a minute alternately on his stomach, and on one side, pressure to the thorax and abdomen to be applied when he is lying on his stomach. Dr. H. R. Silvester places the patient on his back, with the shoulders raised, and the tongue drawn forward. He then alternately lifts the ribs and sternum by extending the patient's arms up by the side of his head, and then compresses the sides of the chest by the patient's arms. Pacini, of Florence, in Italy, has a method, "which consists in placing the patient on his back, on a table or bed, the operator having his abdomen against the head of the patient, placing his hands in the axillæ on the dorsal aspect, and then pulling the shoulders toward him with an upward movement at the same time. The shoulders are then relaxed, then the former movement, and so on alternately." Dr. W. P. Bain (standing, I suppose, at the head of his patient,) "places his fingers in the axillæ in their front aspect, with his thumbs over the outer ends of the clavicles, and draws the shoulders towards him. On relaxing his hold, the shoulders and chest return to their former position, and so on with alternate motion."

The Ready Method, as that of Marshal Hall has been called, was published in April, 1856, and was everywhere hailed with enthusiasm. When Dr. Silvester's method was published in 1858, it suggested to me the one I have ever since practised, and which is as follows: Wherever I find my patient, I lay him on his back, place myself at his head, put my hands under his shoulders, and my fingers in his axillæ;

then whenever I myself inspire, I draw and lift his shoulders toward me; and whenever I expire, I let go the shoulders, and with my own hands firmly press the sides of his chest. Meantime I have an assistant open the mouth, and see if the tongue has fallen back from the lower incisor teeth, and if so I have him draw it out, using for the time his thumb and finger. If the process has to be long continued, I presently resign my place to some strong, intelligent bystander, cautioning him not to work too fast, while I look after the use of the galvanic battery, friction of the extremities, and sometimes enemata of capsicum and ammonia. If, when the shoulders are lifted, I see that the chest is not proportionately elevated, I suspect obstruction of the glottis by the tongue. If need be, I use a tenaculum to hold the tongue forward, rather than pinch it between the upper and lower front teeth, as advised by Silvester; for, as the nares are likely to be partially obstructed by frothy fluid, the mouth should be kept open. Once, on a river bank, some distance from any dwelling, having with me no tenaculum, I passed a threaded needle through the tip of the tongue, a lady present supplying me thread by unraveling the hem of her dress. I ought instead to have borrowed a garter, and with a pin made of it an elastic band to pass over the tongue and under the chin. Upon a child born asphyxiated at Ithaca, N. Y., August 4. 1860, I thus kept up artificial respiration twenty-five minutes before there was the slightest effort at a natural inspiration. But I was all the time assured of success by the improvement in the complexion, which showed that my work was effecting oxygenation of the blood. In 1861, I thus unavailingly kept up artificial respiration in a drowned boy, while on a skiff, and in an express wagon, going to his father's house. In August, 1865, after apparent death from amputation of the thigh, chloroform having been given, a patient of mine, by artificial respiration thus practiced, was temporarily resuscitated, so as to speak aloud, intelligently, and repeatedly, to the pro-

foundest astonishment of physicians, and all others there present.

Marshall Hall's method, no doubt, led the way to the more efficient one of Silvester; and that suggested the one of Pacini, and the similar one of mine; while that of Pacini suggested Dr. Bain's. The three last I deem preferable to Silvester's, because of the awkward and unnecessary use he makes of the patients arms, and the difficulty he must occasionally experience from rigidity of the muscles. Pacini's and Bain's methods (my first knowledge of which was obtained a fortnight ago from Dr. Butler's Compendium) are I think, inferior to mine, in that they do not aid the patient in the process of expiration.

I was led to criticise Dr. Silvester's plan, because (1) in reducing dislocation of the hip, I had experienced the advantage of making extension from the femur, rather than from the ankle. (2.) I had observed the relief given to the exhausted, parturient woman, by pressing one's hands firmly on the top of her shoulder during the last pains of labor. (3.) I like directness of purpose, and hate all roundabout ways of doing things.

Once seen, my method of artificial respiration is instantly understood, easily remembered, and readily practiced, by any person of ordinary intelligence.

Leroy, whose experiments antedate those of Marshall Hall, enforced expiration by compressing the chest with bandages, then, relaxing these, he trusted to the resiliency of the costal cartilages to expand the chest, and so to secure inspiration He appears to have taken no care to guard against obstruction of the glottis by the tongue. So early as 1829, he affected artificial respiration by applying the interrupted galvanic current directly to the diaphragm. His efforts were praiseworthy, and not unfruitful; for, besides stimulating the investigations of Marshall Hall, they led Dr. Charles Kidd, in 1865, to Faradization of the phrenic nerve and diaphragm, whereby he resuscitated a woman apparently dead from chloroform.

There have been various plans for inflating the lungs by means of bellows and tube. But they are not without danger of injury to the lungs, and the apparatus cannot always be at hand. Even when present, Dr. Marcet, one of their advocates, advises "to begin with the Ready Method, in order to lose no time." M. Marchant proposes to insert a tube, like a tobacco pipe, in one nostril, closing the other nostril and the mouth, and blowing through the tube. This process, which can succeed only in case the glottis be unobstructed, is not new. It was, in 1817, minutely described in Hosack's edition of "Thomas' Practice," page 729. Allusion is also there made to Hunter's bellows, "which is of such construction, that by one action, fresh air is thrown into the lungs, and by another it is thrown out again, so as to imitate, or produce artificial breathing." Would not Dr. Dewees have found, in the suction power of Hunter's bellows, the desideratum for his new-born patients, when, in 1826, he says, "Might not a properly constructed syringe be highly useful in removing (from the trachea) the obstructing mucus?" What solid pleasure good Dr. Dewees must have taken in manipulating his little pets, when placing the child's mouth downward, and holding the body and hips higher than the head; at the same time gently shaking the child, so as to disengage any mucus that may be lodged in the trachea, and permitting it to flow from the mouth; then patiently inflating the lungs of the child, by forcing air into them from his own, and next expelling it, by pretty firm pressure on the thorax, by which means he believed that he had saved the lives of many children.

Dr. Dewees knew the fact, but not the reason, of the injurious effect of the warm bath during the interruption of all respiration. Some interesting experiments made by Dr. B. W. Richardson, of London, and others; by Dr. Joseph G. Richardson, of Union Springs, N. Y., attest the value of hot air, internally and externally, when applied at the same time as artificial respiration.

Dr. C. Handfield Jones, in March, 1869, details a postural mode of inducing artificial respiration in asphyxiated children. He says, "I laid him down on his back, and made pressure on his abdomen; then raised him upright on his seat, and so on alternately."

Dr. Billman, of Neustadt, writing in 1867, eulogises catheterization of the trachea and suction, not only for the removal of obstructing mucus and foreign bodies, but as a means of resuscitation in all forms of suspended animation. In the asphyxia of new born children, Dr. Lowenhardt uses "a pump and a fine india rubber tube, ten inches long, with catheter openings at the end. This tube is inserted by the aid of a fine stilet into the trachea, in the following way: "An assistant, with thumb and finger, presses the neck above the larynx, closing the œsophagus, whilst the operator depresses the tongue with his forefinger, and slips in the tube. This tube is then attached to the aspirating, pump which is used to draw out the obstructing fluids; then air is gently introduced."

Is not this process adapted to some cases of croup, diphtheria and scarlatina? I think it is; at Elmira. in 1842, I rescued from inevitable death a boy of twelve years, by passing curved forceps into the larynx and drawing thence a mass of stringy mucus. This was in a case of scarlatina. The patient was a son of the late Mr. Hammond Sly, and I believe that he is still living.

As a further means of resuscitation, Dr. B. W. Richardson has well said, "The great desideratum now is an improved method of artificial circulation of the blood."—*Med. & Surg. Reporter.*

MONTHLY SUMMARY.

A Valuable Cement.—Glycerine and litharge, mixed into a paste, furnish an extremely firm cement for iron and stone, as well as fastening iron to iron, and is said to be particularly adapted to fixing iron to stone, as for railways, etc. The mate-

rial hardens very quickly, and must, therefore, be used at once. It is insoluble in water, and only attacked by concentrated acids. Articles joined with it can be used in a very few hours afterwards. Sandstone blocks, joined by this cement, have broken in a fresh fracture, rather than at the point of the union of the original surfaces. Very dry litharge does not form so good a cement as that which has absorbed a considerable amount of water. Only the purest material is to be used.—*Med. and Surg. Reporter.*

Large Salivary Calculi.—Dr. H. E. Von Rygersma has removed several very large salivary calculi from the mouth of a negro man about 50 years old. The first was extracted by a French surgeon, and was the size of a pigeon's egg. Two were as large as Lima beans. The excretory duct of the submaxillary gland is described as completely changed into a bag, and will readily admit a grain of corn.—*Med. and Surg. Reporter.*

Soothing Syrup.—A correspondont of the *California Medical Gazette* publishes an analysis of "Mrs. Winslow's Soothing Syrup" which will astonish even those who are aware of the deleterious properties of that nostrum. Ten drachms of the syrup yielded 1.14 grain of morphine and other opium alkaloids, "very nearly one grain to the ounce of syrup." If used according to the printed directions, "we have a dose of morphine equal to ten drops of laudanum, given to a child of three months old every two hours, and double the quantity to a child of six months old." Is infant mortality to be wondered at when mothers and nurses deal in such deadly compounds?—*Med. Gazette.*

Death from a Dissecting Wound.—Our exchanges inform us that Prof. Bœhm, one of the most eminent medical men of Berlin, died a few days since under fearful circumstances; while dissecting before a class of students he pricked a finger. He thought it a mere abrasion of the skin and failed to cauterize it. Two days afterwards his hand began to swell, and became enormous. The poison pervaded his whole system and killed him. He retained his conciousness nearly to the last, and saw his end approach with undisturbed firmness.

Painless Cutting in Surgery.—The *Lancet* informs us that " at at late meeting of the British Medical Association, Dr. B. W. Richardson exhibited a knife consisting of a revolving blade, and which divided with such rapidity that superficial incisions could be made with it without pain. The revolutions were about twenty-five per second, but the speed might be greatly increased. The knife in its action illustrated that an appreciable interval of time is necessary for fixing an impression on the mind, and for the development of consciousness. He hoped he should soon be able to give to the surgeon a small pocket instrument with which to open abscesses, and perform many minor surgical operations painlessly, without having recourse to either general or local anæsthesia."

An Ingenious Method for Drying Vegetable and Animal Substances.—A method recently adopted for drying vegetable and animal substances, consists in filling a vessel half full with fused chloride of calcium, pouring ether upon it, and then placing above it a vessel containing the material to be dried. The vessel is placed upon a glass plate, and over this a bell-glass fitting completely to its surface. The chloride of calcium abstracts the the moisture from the ether, which then constantly takes away a new quantity from the substance in the vessel above, until it is quite dry. Articles dried in this manner have quite a different appearance from those from which the moisture is removed by by the ordinary process, vegetables retaining their natural color, and animal substances their elasticity and flexibility.—*Med. and Surg. Reporter.*

Warts.—The modern scientific name of this disorder is *Myrmekiasmos*, but the principal point is the surprising rapidity with which an extensive cluster of warts will disappear under the use of arsenic, without any local application whatever.

Potassa fusa has been used locally. The warts should be saturated with a solution of equal parts of potassa fusa and water, until the horny growth is dissolved and the papillæ destroyed by this caustic.—*Med. Gazette.*

BIBLIOGRAPHICAL NOTICES.

It has been remarked that, as a science and an art, Dentistry is extensive enough to occupy all the time and thought which is not taken up in practical work. This is not so, for it is possible to combine a thorough knowledge of all that pertains to the profession, with a great deal of general knowledge of other subjects.

The Dental practitioner should have such a knowledge of elementary scientific truths beyond his special science, as shall enable him to understand the common physical facts of the world in which he lives, and be capable of appreciating the best thought and knowledge of the times.

The broader a man's culture, the better he can apply such facts as experience may give him, and the sounder will be his conclusions, and the more useful and honorable his career in any profession, to say nothing of the dignity educated members impart to the profession itself.

To those who appreciate the importance of a liberal education, and have a broad and manly view of their profession, and are eager to increase its honor and estimation among men, we recommend the following useful and interesting publications:

The American Naturalist. This is an illustrated monthly magazine of Natural History, published by the "Peabody Academy of Science," at Salem Mass., an institution founded by the late George Peabody, and one which will, with many others in this country and Europe, prove a lasting moment of a noble ambition to benefit and instruct mankind. The subscription price of the "Naturalist," is $4.00 a year, and we feel assured that it will prove interesting as well a instructive to every one no difference what his profession may be.

Another useful publication is the *Scientific American*, a well known and very popular weekly journal with all who take special interest in the practical arts and sciences. Every number has sixteen imperial pages, illustrated with engravings of new inventions of every kind. The subscription price is $3.00 a year, Munn & Co., Publishers, 37 Park Row, New York.

The Manufacturer and Builder, is another publication similar to the last named, and contains a great deal of useful information upon practical subjects. Its pages are highly embellished with engravings of inventions, designs of buildings and works of art. The subscription price is $1.50 a year, so low that we are at a loss to imagine how such a handsome magazine can be issued on such terms. It is published monthly by Western & Company, 37 Park Row, New York.

Those of our readers living out of the large cities are all, to ome degree at least, interested in agriculture. To such we ould recommend the *American Agriculturist*, published by wrange, Judd & Co., 245 Broadway N. Y., as being one of the

best, if not the best paper of the kind issued.

The suggestions of such a publication as this one have proved of great value to those engaged in agricultural pursuits of every nature, such as farming, gardening, fruit growing, &c., &c. Each number of the "Agriculturist" contains from 32 to 44 pages, filled with plain, practical and reliable matter, with many beautiful and instructive engravings. It contains each month a calender of operations to be performed on the farm, orchard, garden, and in the dwelling, with a household department, and also one for children and youth. It has now reached its 29th volume and is issued at $1.50 a year or four copies for $5.

The Southern Review. The first number of this Review which is edited by the well known writer Dr. A. T. Bledsoe, assisted by Rev. E. J. Stearns, of Baltimore, Md., was issued in January 1867, and has gained such a reputation that it is now acknowledged to have no superior of its class. It is an organ for Southern men of letters, and among its contributors are to be found the names of some of the ablest writers of the country. All the interesting questions of the day, pertaining to literature, art, science and philosophy are treated in its pages. It is published on the first days of January, April, July and October, at $5.00 per annum.

The New Eclectic Magazine, is the title of another valuable Baltimore publication, formed by the consolidation of the "Richmond Eclectic, and "the Land we Love." It is devoted to the publication of selected articles from the best American and Foreign periodicals, and original papers on general literature, science, art, and the educational and material development of the Southern States. It is published by Turnbull & Murdoch, 54 Lexington St., at $4 per annum.

Once a Month is the title of an illustrated magazine of good reading for the public, liberally illustrated. It is of high literary excellence, entertaining and instructive. Terms $2 a year, three copies $5 a year. T. S. Arthur & Sons, 809 and 811 Chesnut St. Philadelphia, are the Publishers.

The same Publishers also issue *The Children's Hour,* one of the best magazines for children in existence, at $1.25 a year, or five copies for $5. The well known author T. S. Arthur, edits this work, assisted by a number of popular writers.

Hitchcock's New Monthly Magazine, is another publication which is attractive and valuable. It presents a handsome appearance and is finely illustrated, containing also vocal and instrumental music of a high order. The subscription price is $3 per year. Benj. W. Hitchcock, Publisher, 24 Beekman St. N. Y.

One of the oldest magazines, and one too which stands at the head of its class is *Littell's Living Age,* which has now reached its one hundreth volume. It is issued every Saturday, each

number containing 64 pages of the valuable literature of the day, embracing reviews, criticisms, tales, poetry, literary, scientific, bibliographical, and historical information. Published weekly at $8 a year. Littell & Gay, 30 Bromfield St., Boston.

EDITORIAL DEPARTMENT.

Hydrate of Chloral as an Anæsthetic.—A great deal of interest is manifested in this anæsthetic compound, and there is scarcely an exchange received which does not contain some notice of its nature and properties.

Chloral, from which the hydrate is obtained, is formed by passing chlorine gas through anhydrous alcohol, with subsequent distillation The hydrate takes the form of white crystals, which are very soluble and readily absorbed when they are administered by the mouth or by subcutaneous injection. The manufacture of chloral is attended with difficulty and expense. Well dried chlorine gas is passed through pure anhydrous alcohol as long as it is absorbed, which process consumes many hours, and the vessel containing it must be kept cool in the first stages of the operation, but in the following stages the temperature must be gradually raised until the contents boils. Absolute alcohol must be employed in the preparation of chloral, for if it is diluted, instead of chloral being formed we have aldehyd, acetic acid, and hydrochloric acid. Care is also necessary to prevent the generation of such compounds as chloride of carbon and chlorous acetylene, which are dangerous. After the passing of the chlorine gas through anhydrous alcohol, the crude product is mixed with three times its bulk of oil of vitriol, and distilled by means of a gentle heat; which operation is often repeated several times and the product distilled over quick-lime.

This is by no means a new anæsthetic, as it has been known in chemistry about thirty-eight years. Liebig having discovered chloral (from which the hydrate is made by the simple addition of water,) in 1830, but, as Dr. B. W. Richardson states, the introduction of it into medicine is a fact of the present year, its introducer being Liebreich of Berlin.

Hydrate of chloral then is a chemical combination of water and chloral, the process for the generation of this latter having been described above. It is expensive, as was before remarked, because one pound of alcohol yields less than an ounce of chloral. When the chloral is generated it has the appearance of a colorless, oily liquid, with a pungent odor, and is an irritant to the skin. The chloral is now mixed with a small quantity of water, and on applying heat it solidifies, the product being a white crystalline substance known as the hydrate of chloral—the an-

æsthetic in question. The crystals are rhombic, contain 90 parts of chloral, as in their formation eight parts of chloral combine with one part of water, forming nine parts of hydrate of chloral. It volatizes readily without decomposition although in a solid form, resembling in this respect camphor. Water, alcohol and ether dissolve it. The manner in which hydrate of chloral is administered, is in solution with water, either by subcutaneous injection or by the mouth directly into the stomach. Dr. Richardson tells us that the best solution is made by mixing one grain of the hydrate with two of water. and he also affirms that it can be administered, to some extent, by inhalation. Dissolved in an excess of water the taste is agreeable, with the odor of a ripe melon.

Administered to human subjects, doses varying from thirty to sixty grains caused unconsciousnes to pain and a profound sleep lasting over several hours The sleep is quiet and gentle, induced without distress, and leaving no other symptom behind, except nausea which is occasionally experienced after recovery. In administering this agent to the human subject, Dr. Richardson, states that allowance will have to be made not only in relation to size and weight, but to obesity or leanness, to natural habit and actual state of body in respect to sensibility. In administering it to lower animals, Dr. R. also says, there is a common rule in respect to weight of animal and dose of hydrate; thus an animal weighing, say three ounces, requires one grain of the narcotic to be brought fairly and fully under its influence. If the proportion of dose be beneath this, the symptoms will be imperfectly developed; if it be much exceeded the symptoms will end in fatal sleep. Liebreich claims to have produced sleep which lasted from five to fifteen hours, with from 25 to 30 grains of the hydrate, but experiments made with an American preparation by Dr. Hasket Derby were not so satisfactory, more of the agent being required and a longer time to induce sleep, as well as the sleep continuing for a much less time and in none of the cases being of a longer duration than four hours, although the quantity administered was as much as 75 grains.

This anæsthetic agent appears to act more promptly when subcutaneously injected than when administered directly by the mouth; and as chloral dissolved in water is slightly caustic, it cannot be administered by the mouth when there are lesions of mucous membrane, or ulcerated tracts of intestinal canal.

While Liebreich considers chloral an anæsthetic of some power, though inferior to chloroform and ether, Dumarquay, a French writer, stated to the Academy of Sciences, that as a result of experiments on animals and men, he considers it no anæsthetic, as the skin is sensitive no matter how great the intensity of the sleep. He finds it, however, the most rapid of hypnotics, and draws

the following deductions: "1. Chloral has a marked hypnotic action, especially on feeble and debilitated individuals. 2. The duration is in direct agreement with this feebleness. 3. The sleep provoked is generally calm, and is exerted only in those patients who are a prey to lively pain, This leads one to counsel its use in those diseases where it is desired to bring on sleep and muscular relaxation. 4. Finally, this agent can be given in doses of 1 to 5 grammes without determining any accident."

On the other hand M. Bouchut, before the same Academy, agrees with the views of Liebreich, and asserts that "chloral exerts powerful sedation upon both motor and sensitive nerves, when employed in the crystallized form and free from impurities; that the dose should not exceed five grammes (77.16 grs.) for adults, or one or two grammes for children. He condemns as dangerous its use by hypodermic injection, and states that it is more rapidly absorbed by the rectum than by the stomach. He agrees with Leibreich in attributing its action to its conversion into chloroform. The sleep induced by it is sometimes attended by an agreeable intoxication. Hyperæsthesia is rare under its influence, the usual result being anæsthesia, varying in degree according to the strength of the dose. In its therapeutic relations, M. Bouchut pronounces chloral to be the most valuable sedative known in the violent pain of gout, of nephritic colic, or of dental caries—the best of anæsthetics to be given by the stomach; and the quickest and surest remedy in aggravated chorea, to quiet the restlessness which is the most serious symptom of that disease."

M. Leon Labbe states as the result of his experiments:

"1. Chloral, when introduced in sufficent quantity into the blood of an animal, produces anæsthesia, but without that preliminary condition of excitement which obtains with chloroform.

2. When introduced into the alimentary canal, or under the skin, it produces first sleep, and then anæsthesia, but in a lesser degree than when directly introduced into the blood.

3. In these cases there is some slight irritation, but nothing to be compared with hyperæsthesia."

New Mode of Administering Nitrous Oxide Gas.—The *Lancet* informs us that some interesting improvements in the mode of administering nitrous oxide gas have recently been perfected by Mr. Coleman, at the Dental Hospital of London. On Thursday, the 17th inst., this gentleman anæsthetized upon a new plan eight patients in the hospital, for the removal of teeth. All who have had much experience in the use of the protoxide of nitrogen have found that any admixture of air with the gas, greatly impairs its efficacy. The insensibility is less rapidly and less perfectly produced under these circumstances, whilst the patient is

invariably more excited during, and more prostrated after, the inhalation of the gas. In order, therefore, to secure the entrance into the blood, through the lungs, of pure nitrous oxide without accompanying air, Mr. Coleman so arranges his apparatus that he first dilutes with nitrogen the oxygen of the residual air of the lungs, and then permits the patient to breathe pure nitrous oxide. By this method the patients become more speedily unconscious, and the anæsthesia lasts longer, at the same time that they appear throughout the adminstration calmer than is usually the case under the ordinary mode of administration. It is a noteworthy fact, also, that in none of the eight cases was there the least appearance of lividity. During the exhalation of the nitrogen, the pulse was noticed to fall steadily, but upon supplying the nitrous oxide it soon regained its force and frequency. Mr. Coleman stated to those who witnessed the inhalation, that he believed that hydrogen would be more succesful than nitrogen, but as the inhalation of that gas often produces disagreeable sensations, he preferred trying the effects of nitrogen before employing hydrogen. If, by this new mode of administration, it shall be found that the anæsthesia produced by nitrous oxide can be rendered more lasting, say for a period of even only ten or fifteen seconds, It will be a great boon to the dentists, who oftentimes have most uncomfortably to expedite their operations with it. As regards cost, the above plan would be found the most economical of any yet devised.

A New Medical Journal.—The first number of a new monthly Journal, under the title of *The Baltimore Medical Journal*, will be issued early in January, under the editorship of E. Lloyd Howard, M. D., and T. S. Latimer, M. D. The plan of this Journal will embrace Original Communications, Selected Articles and Translations—from home and abroad; Reviews, and Bibliographical notices, with Editorial notes on current Medical Topics. The co-operation of some of the most talented writers of the country has been secured, and we feel certain, from the well known ability of the editors, that this new enterprise must prove a success. In form and size, we understand that the new Journal will resemble the *London Practitioner*. There is no reason why such a Baltimore Publication should not meet with favor and be largely patronized by the medical profession.

Those of our readers who do not subscribe for a Medical Journal, will find it to their advantage to become subscribers to this new Journal.

Chevalier's Instruments.—We have received from this New York firm some excavators, introducers and condensers, which, after due trial, we cannot praise too highly for temper, fineness of serrations, general form, length and finish. The introducing and condensing instruments especially, are, to say the least of them, models of their class, and we congratulate this firm on their success in producing such excellent instruments as the ones we have tested.

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Recent Histological Views as Regards Enamel and Dentine.

An Abstract of a Lecture delivered Jan. 4th, 1870, at the Balto, College of Dent. Surg.

By HENRY R. NOEL, M.D., Prof. of Physiology.

Immediately after the closure of the follicles by the opercula and the inaugeration of the saccular stage, there begin certain changes which have an important bearing upon the further development of the tooth. The tunica propria now invests the papilla and the tunica reflexa lines the inner surface of the dental sac, and in the space between these, *i. e.* between papilla and inner surface of dental sac, we have a space in which *enamel, dentine, and cement, organs so called,* are to be developed. But just here a most thorough change takes place; the papilla begins to lose its character as a papilla and to acquire that of a pulp—vessels and immature connective tissue come into existence, and the vascularity is greatly increased. In the walls of the dental sac or capsule a similar change occurs, and we find that here also the vascularity is greatly increased; in fact, the blood vessels gradually extending invade the entire sac or capsule and lie directly beneath the outer membrane of the sac and directly

above the tunica reflex, or perhaps more correctly, directly *external* to the tunica reflexa; the walls of the *sac* consisting now of two delicate membranes with a vascular net work between the two. The inner of these two membranes is the tunica reflexa, and between it and the pulp now vascular, we will suppose that nothing is found, and in this space we purpose to show you the progressive development and final calcification of the enamel and dentine organs.

Upon the *inner surface of tunica reflexa*, and fed by the vessels upon its external surface, we shall find masses of germinal matter; or nuclear matter, if you prefer the latter term; and these masses increasing in number grow inwards in the direction of the late papilla but now vascular pulp; simultaneously there is found upon the external surface of the pulp, *i. e.* external to and resting upon the tunica propria, masses of germinal matter; these two, different and distinct collections of germinal matter, fed by different and distinct vessels, increase rapidly in quantity, the first named collection growing inwards, and the second collection growing outwards, of course must grow towards each other and meet.

This line of union—this line of meeting shall hereafter mark the *line* of contact between the enamel, and the dentine; we will call this line for convenience sake "The Line of Conjunction"; it will be the boundary between enamel dentine.

Now a careful analysis of the subsequent changes, proves that upon this very line, the first definitely formed elements appear; or, in the language of Dr. L. S. Beale, the germinal matter changes to formed material and ceases to respond to the "carmine test," first at this line of junction; here we have a determinate tissue—a definite anatomical element arising, and this tissue or these anatomical forms increase in quantity, but they increase in exactly an opposite direction to the growth of the germinal matter.

The germinal matter begins on the internal surface of the dental capsule for enamel, and upon the external surface of

the pulp for dentine; the two growing, the one inwards and the other outwards, meet at the "*line of conjunction*;" the enamel organ growing in, the dentine organ growing out as regards germinal matter, but as regards the formed material or first definitely formed elements, we find them beginning at the *line* and extending outwards for enamel and inwards for dentine. The formed material for enamel and the formed material for dentine. begin first at this *line*,—first at a common starting point and grow or increase in diametrically opposite directions; that for the enamel grows out towards the dental sac—that for dentine grows in towards the pulp —as a necessity, therefore, for each organ the formed material grows back along the exact line through which the germinal matter advanced.

The "formed material," or anatomical forms, the terms meaning exactly the same thing, will finally reach the dental sac for enamel—and reach the dental pulp for dentine; the enamel organ is now fully formed and lies between *capsule* or *sac* and "*Line of Conjunction*"; the dentine organ is also now fully formed, and lies between the *pulp* and "*line of conjunction*"; of course upon this *line* the two *organs* meet and touch each other.

Now as to the constituent elements of the two organs, what are their shapes, or characteristic forms respectively?

Enamel Organ—Is composed of little bodies resembling rods, or columns, these little bodies are placed side by side and packed closely together, so very closely are they packed that they compress each other and from being more or less cylindrical they become somewhat hexagnonal or at any rate polygonal; these bodies extend from "line of conjunction" to the inner surface of the dental sac, and have no intervening substance whatever, but each rests freely and fully against its neighbors; many of the bodies contain nuclei, especially near the ends in contact with the sac, these nuclei are nothing more than masses of germinal matter which have not as yet changed to formed material, but most of them are changing, and 'l should ultimately change into it.

These enamel rods or columns, are first found upon the "line of conjunction," and can be traced by progressive steps, from this line out to the inner surface of the sac; here we notice, that the germinal matter is *all* consumed in the production of these columns or little bodies, and the space between the *sac* and line of conjunction, once occupied by germinal matter, is now occupied by formed material in the shape of closely packed rods, columns or bodies. This is the *enamel's organic Basis*, and when this becomes calcified we have *enamel.*

DENTINE ORGAN. From the "line of conjunction," to the pulp proper, we have the dentine organ, and the statement made as regards enamel is also true as regards dentine; viz; that the formed material begins on the line of conjunction and extends to the pulp, but here there is a slight difference as regards germinal matter; for in the enamel organs every atom of germinal matter changes to formed material, every atom is or should be consumed in the production of the soft, solid columns or rods of which the enamel organ is composed, but this is not so comprehensively true of the dentine organ, all of the germinal matter is *not* changed into the formed material, a *portion* remains unchanged.

The dentine organ, therefore, will exhibit under the microscope and under the "*carmine test*" of Dr. L. S. Beale, both formed material and germinal matter, the formed material being found in the shape of "Columnar Epithelial Cells Nucleated" and the germinal matter being found as the *nuclei of these cells.*

A critical analysis of the dentine organ under the microscope, shows the organ to be composed entirely of these cell elements, or columnar bodies and the nuclear matter, so arranged as to give a fibrillated appearance to the whole organ; the cells or bodies are extremely minute, in fact they are not *true cells* as they have no distinct walls, but appear to be solid cylinders with a central portion of nuclear matter, and are arranged in linear series so as to form *Fibrillæ;* the whole organ just before calcification, consists of

these fibrillæ and there is *no* interfibrillar substance whatever. In many and perhaps in most of the fibrillæ at this period, there is a thorough conversion of the central axis of nuclear matter into formed material, or into solid fibril; these solid fibrils, then run from line of conjunction to pulp, and consist entirely of formed material, but there are many that run between the same points, which still retain a central axis of nuclear matter, having only their periphery of formed material.

Now these two kinds of fibrillæ lie side by side, and represent different stages only, not different kinds of tissue; the tissue is identically the same in each kind, the only distinction being that in the one the whole of the germinal matter has changed to formed material, in the other a central portion remains unchanged; the shape &c., of the two are the same, their whole nature and their characteristics identical.

The dentine organ, therefore consists of nothing but fibrillæ, some of them solid (completely changed throughout) others apparently solid but having in reality a central axis of nuclear matter, which may or may not change to formed material, though liable to and capable of doing so at any time; should this central portion, of nuclear matter, change to formed material, the fibril would be solid and would then be identical with the other solid fibrils.

Relations to the Pulp.—The fibrils run into and blend in organic continuity with the tissue on the peripheral surface of the pulp; on this peripheral surface we find the same columnar nucleated bodies and nuclear matter; the connec- tissue corpuscles and nuclear cylinders of the incompletely changed fibrillæ run together, and the tissue and the solid fibrillar substance blend in organic continuity.

The dentine organ extends, therefore, from the line of conjunction to the pulp, and rest upon this pulp, directly and immediately, with no tissue or structure between organ and pulp, save where immature connective tissue crops out here or there; even then the organ and this tissue blend so

intimately that it is impossible to make any distinction in their anatomical elements.

CALCIFICATION.—The enamel organ being formed and the dentine organ being formed, calcification begins on the line of conjunction and extends out towards the *sac* for enamel, and in towards the pulp for dentine; the calcification is thorough and complete for enamel—all of the polygonal bodies being completely calcified. For dentine the calcification is *not so very thorough and complete*; the solid fibrillæ are calcified thoroughly, but many of those having central masses of nuclear matter are only partially calcified, leaving the central nuclear matter, and more or less of fibril surrounding it still uncalcified. The calcification is more thorough near the periphery and less complete as we approach the pulp, hence the uncalcified fibrillæ are very small indeed near the line of conjunction but large near the pulp.

The calcified enamel organ gives us the enamel, the shape and general outline of the rods or bodies remaining the same; the calcified dentine organ gives us dentine, but the calcification is complete in the former and partial or incomplete in the latter, and the incomplete calcification gives rise to the "fleshy fibrillæ," found in the dentine of the fresh tooth, or in recently extracted teeth.

On the line of union of enamel and dentine, there is an almost complete calcification of the fibrillæ, the portions remaining uncalcified are so exceedingly minute that they appear as the faintest of thread like traces, but from this line towards the pulp the calcification appears to involve less and less of the fibrils until we reach the pulp itself and here the fibrils are of some considerable size.

The calcified fibrils form dentine, those uncalcified retain their character as fibrils; but, and I wish to be clearly comprehended upon this point, those which remain uncalcified during the first processes of calcification, and even after the tooth is cut and has passed through the gum, *may become calcified at some subsequent period* and form dentine. It is probable that after the teeth are cut, a slow but progressive

calcification takes place until the death of the individual or death of the pulp.

Dentine will thus become *denser* or more condensed as the tooth becomes older, and that portion of the dentine organ which is left uncalcified around the pulp, may also become calcified to a greater or less extent, and the dentine be increased in thickness from pulp towards the enamel. In fact the dentine organ, so called, may even after adult life increase, and encroach upon the pulp cavity and becoming calcified diminish the size of that cavity. The fibrils prior to calcification, are not simply straight, but they curve, wave, divide and branch; and as this is true of the "whole organ," it will be true of that portion which remaining uncalcified, we have to study as dentinal fibrillæ.

From the above statements we deduce these conclusions:

I.—That the dentinal organ is composed of fibrillæ, more or less aborescent or branching.

II.—The organ extends to the pulp, and surrounds and closely invests the pulp.

III.—The calcification of a portion of the Fibrillæ gives us hard dentine.

IV.—The portion remaining uncalcified, we call dentinal fibrillæ.

V.—That the dentinal fibrillæ are liable at any time to become more or less calcified and form dentine.

VI.—That there is no difference between the calcfied and the uncalcified fibrillæ, unless we except the central axis of nuclear matter as distinctive.

VII.—That this central axis is liable at any time to change into fibril, and, as fibril, liable to be calcifiied, and form dentine.

VIII.—There is no inter-fibrillar substance whatever.

IX.—Fresh dentine, therefore, has no tubuli but has uncalcified fibrillæ, solid or nearly solid.

X.—That the tubuli found in the dry tooth, or dead and dry tooth, and formed by the dessication are evaporation of

these dentinal fibrillæ, and have no existence in the living tooth.

XI.—That the difference between dentine and the fibrillæ is simply one of mineral element, and the fibrillæ may at any time take up this mineral element and become true dentine, *i. e. calcify.*

XII.—Enamel and dentine are not vitalized tissues, as far as the calcified portions are concerned; enamel is dead—perfectly dead—and dentine would be equally as much so, were it not for the fibrillæ uncalcified; enamel proper and dentine proper are amenable to physical and chemical laws only, and therefore any sensitiveness in dentine is in virtue of its fibrillæ, and of their organic continuity with the terminal nerve fibres in the pulp.

ARTICLE II.

Microscopy of the Dental Tissues.

By S. P. Cutler, M.D.,A.E.,D.D.S.

Prof. of Chemistry & Histology, N. O. Dental College.

Concluded.

Physiology.—In my last article I assumed that all the life or vital forces were apparently spent on muscular motion without which there could be no animal existence, as animal existence is intimately dependent on muscular motion. Sentient impressions may be and are felt through sensorial nerves including those of special sense, as the five senses, though no response could be given in any manner to any impression received or conceived independent of muscular motion. Thinking might be carried on but could not produce any result without muscular contraction, the latter being an effect of a cause, that cause the direction of a force held in reserve.

Without muscular motion there could be no expression, no utterance; whether through the vocal organs or manual acts, all the same. In all the lower animals instincts of

self preservation and reproduction are the chief ends to be accomplished, and are the prime motives of their existence. Man possesses all these, and in addition those of intellectual and moral faculties, which in the higher walks of cultivated life enable him to enjoy both the higher and lower attributes of life. In both man and animals muscular motion accomplishes or does all the work of animal life. Chemical agencies, by this term meaning both agents and actions, furnish motive power for muscular action, as they do not act within themselves but have to be acted on by some outside force sent to them independent of any innate consciousness indwelling in the muscles themselves, as already stated. As a muscle acts there is a greater amount of vital force generated there by increased influx of circulation and consequent oxidation.

This increase of force, per se, does not directly impart additional energy or power, but indirectly, through the brain and spinal column, by first being sent up through the sensorial nerves from the muscle, thence back through the outer nerve to the muscle as additional force, not only to the muscle alone but the entire organism in common, the greatest amount being spent where the greatest demand exists, as in the case of muscular activity, which is the point of greatest disturbance, demanding fresh supply of force.

No work is done without expenditure of force, even thinking requiring consumption of carbon, and, as the Germans say of phosphorus, *uno phosphor kine gideankie*, or, without phosphorus no thought. Phosphorus being more readily oxidisable, an excess of it is found in the brain and nerves over other tissues in consequence. All the forces then in organic life were in the first instance, preexistent in the inorganic elements that enter into organisms, together with free oxygen that enters and combines with all the oxidisable elements, the act of combining being the source of developing force, the actual force, as developed, coming mainly from the oxygen that enters the system. The latent caloric of the oxygen by combining, being set free in the form of sensible

heat, then vital force. This force is given up by the oxygen in consequence of its lessened capacity, resulting from condensation of oxygen in its union with carbon and other elements though mainly carbon.

In the union of oxygen with carbon, the volume of oxygen being lessened, its capacity for heat is lessened in proportion, and a proportionate amount of heat force set free. In making these estimates, it must be taken into consideration that there are some losses of force resulting from a radiation from every portion of the tissues, and given up to surrounding media. Wherever there is friction there is heat force generated, then again it requires force to produce friction; and necessarily, a certain amount of force is expended in producing friction, as in the circulatory and respiratory movements, the friction of the blood upon the vessels, the air upon the air passages, muscular fibres among themselves, and upon surrounding tissues, all require expenditure of force to produce these frictions, as friction depends on motion and motion is produced by force. In turn friction develops force to a given extent, not equal to the amount expended to bring it about.

Force then may be regarded as being derived from outside influences being brought to bear upon the organism by chemical union or combination constantly taking place throughout the organism. The antagonisms of surrounding media with the organism are exhaustive influences constantly varying in temperature, absorbing heat force by radiation from the body's surface, and exhalations from the lungs of watery vapor and carbonic acid, taking out with them a large amount of caloric, thereby constantly lowering the internal temperature, as the surface does the surface temperature. No forces in the body are created, or lost, or annihilated, they are only developed or transformed from static to dynamic conditions, and from dynamic in turn to static, first derived from the static oxygen of the atmosphere, and returned to the static atmosphere by or through the agency of carbonic acid and watery vapor.

Without chemical affinity in the organism no life manifestations could possibly take place, as there could be no force developed, life manifestations being the resultant of dynamical force, also static force held in the brain as reserve ready to become dynamic by direction of will. All forces, whether in the organism or out of it, anywhere in the cosmical universe, are mutually convertible, none being created or destroyed, all phenomena depending on mutual action and reaction of matter and force.

Wherever there is an increase of force at any point there is disturbance, and this is produced at the expense of the surrounding elements which have given up the same amount of force that has been manifested by the disturbance, measure for measure, under all circumstances, the tendency being towards equilibration, which never precisely takes place. In order to first develop life force from the inorganic kingdom, solar influence is requisite in order to cause disturbance and give new directions to preexisting dormant, inorganic forces, otherwise there never could be life manifestations on the earth, all would be silent inertia and the earth would fall to absolute zero on its surface.

All undirected forces act in the direction where least resistance is offered, either in or out of the organism. This is strikingly illustrated by the action of electricity or galvanism, either in the clouds or galvanic batteries, the charge seeks the easiest route, such is the case with the telegraph also, it is easier for the force to follow the wires than to leave it, because wire is a better conductor than the surrounding media, offering less resistance.

This is the case with conducting nerves carrying vital force from the brain to the muscles, a certain amount being lost on the route, as is the case with telegraphic wires. Whether nerve force be a subtle fluid or only an effect of matter without any actual flow of something through the nerves, is yet an unsettled problem, as is the case of magnetic conductors. Molecular disturbance constitutes the recognized phenomena in either case, as no actual fluid has ever been recognized.

The exterior and interior of muscles are supposed to be in opposite states of polarity, simulating a magnetic battery. If such be true, oxidation in the muscles themselves would be facilitated, or, these opposite polarities may be the result of oxidation in the living animal though not so in the dead. Whether force will be regarded as an entity independent of matter or subservient to its control in any way is yet an unsettled point. We find it only in connection with living organisms, leaving when death take place.

Life then is the result of antagonistic forces culminating in the living organisms, resulting in death on the one hand and reproduction on the other. Life and death are continually shaking hands at every point in the living animal, and whenever these mutual exchanges cease, death or inertia is the consequence, life phenomena being exchanged for inorganic, molecular phenomena.

ARTICLE III.

*Extirpation of an Osseous Tumor of the Upper Jaw.**

By W. R. WHITEHEAD, M. D. (Univ. of Paris).

Osseous growths of the jaws present many points of interest, which are revealed by a careful study of their anatomical appearances and clinical features. It is a subject eminently worthy of remark, and might be appropriately considered at this time. I have, however, on a previous occasion endeavored to describe succinctly this variety of diseased growth of the upper jaw, in connection with other tumours of this region equally interesting and deserving of notice.† More than a general notice of the subject now would be departing from the simple design and original object of this communication; which is the description of a case of excision of the superior maxilla, of peculiar importance, and attended with the most favorable results.

* Dr. Whitehead sends us full particulars of this interesting case, (which was first published in the *Medical Record*), with the result of treatment up to December, 21st, 1869.—ED.

† See Remarks on certain tumors of the Superior maxilla. New York Medical Journal. Vol. III. 1866 No. XVII. And also in No XV. of the same volume the report of a case of excision of this bone for an osseous tumor.

Case.—Miss F. P——, from the South, aged eighteen, of good constitution, well formed, and slightly above the medium size, was afflicted with a tumor of the upper jaw. She came to New York on the 28th of December, 1866, and placed herself under my care for the purpose of having it removed. A few weeks prior to this date, I was consulted by her, at which time I examined the growth, and became acquainted with its previous history. At three years of age her nurse let her fall, and she received a blow, which bruised her right cheek; when six years old, a slight enlargement of the cheek on that side was first observed, which, however, was not very apparent, and caused her parents no uneasiness; but at the age of ten, the enlargement had sufficiently increased to excite their apprehensions.

Many medical gentlemen were consulted, who differed widely in their opinions regarding its nature. Topical remedies were ineffectually used, and constitutional means unavailingly essayed. About four years ago, the parents of the young lady visited Richmond with her, and consulted a distinguished surgeon, the late Dr. Chas. Bell Gibson, who advised the excision of the tumor. This gentleman expressed an unwillingness to give chloroform in the operation, and terrible apprehensions of pain deterred the parties from permitting it to be undertaken without the use of an anæsthetic. She suffered constantly from headache, during a year preceding the removal of the tumour. Two or three months previous to its excision, it grew rapidly, especially towards the orbit, and the headache increased with its extension in this direction. Last fall she had chills and fevers, which persisted irregularly until within a few weeks of the day of the operation. My first examination of the patient permitted me to observe that there was considerable deformity of the face, caused by a tumor occupying the right superior maxillary bone, slightly distorting the mouth, and making the cheek quite tense. This tumor invaded the orbit, and pressing upwards, narrowed the orbital cavity in its transverse direction, and compressed the eye. The roof of the

mouth of the right side was slightly depressed. By passing the end of my index finger behind the extremity of the alveolar arch, feeling and circumscribing the posterior and external surfaces of the tumor as thorougly as possible, and carefully observing the deformity caused by it, I could judge with a certain degree of precision the extent of the disease. The mass appeared ovoid, had a smooth and regular surface and to every part accessible to the touch was exceedingly hard on pressure, which was without pain.

The headache, from which she had so long suffered, appeared to be due to compression of the second branch of the trifacial nerve, and its anastomosing branches. The two last molar teeth were gone, and the remaining molar tooth was much decayed; the other teeth on that side were sound. The voice was but slightly nasal or indistinct. Mastication was not impaired to any extent, and the patient swallowed without difficulty. Apprehensions of the continued increase of the tumor, and its rapid extension recently towards the brain, excited the fears of the young lady, and caused her to desire the removal of the growth without unnecessary delay; and although its extirpation was the principal and most urgent reason for the operation, yet a very natural solicitude about the extent of deformity which might remain afterwards, was to her a source of considerable disquietude, and made me desirous to prevent, if possible, cicatricial marks about the face, resulting from incisions of the cheek or other part conspicuously apparent.

Believing that moderate sized tumors of the upper jaw could be removed without cutting the lip or cheek—an opinion which has already been expressed by Ferguson and some others, though not convincingly demonstrated—I experimented on the cadaver with a view to determine the degree of mobility of the parts about the mouth, and also the extent to which this cavity can be stretched by the use of well adapted means. These experiments were simple, and appeared satisfactory. They consisted in exposing thoroughly the bony opening of the nares, by a dissection of the

soft parts from the anterior nasal spine of the maxillæ, and thus facilitating the dissection of the anterior surface of either of these bones, as high up as the orbit, and rendering the nasal and malar processes quite accessible to bone-scissors and other instruments. By the use of cheek retractors, a gradual and very considerable dilatation of the mouth was effected. These experiments encouraged me to hope that I might be able to remove the tumor without cutting the lip or cheek of the patient. The only objection which occurred to me was, that the distension of the cheek or distortion of the parts might, if the mass were larger than previous examination had enabled me to determine, render the anterior part of the tumor as high up as the orbit, inaccessible to dissection. Being prepared, however, as well as possible against all contingencies, and provided with suitable instruments, efficiently assisted, and ready to avail myself of any advantages which could not be anticipated, on the second of January 1867, I proceeded to remove the diseased growth, and to test the value of the experiments previously made on the cadaver.

Operation.—The patient was seated in a dentist's chair procured for the occasion; and after she had taken a small quantity of brandy and water, ether was administered to her, and the operation commenced by detaching, with a pair of strong scissors, the soft parts from the anterior spine of the maxillæ, and partially exposing to view the anterior bony opening of the nares. At this time the patient commenced to vomit; she had, however, not taken any breakfast that morning, and the cause of the vomiting was attributed to the ether. Considerable delay was caused by this interruption of the operation. Ether was not again used, but after she had swallowed more brandy and water, she was rapidly made insensible to pain with chloroform, and my dissection of the gum from the tumor continued. The cheek retractors provided for forcibly stretching the orifice of the mouth were well applied, and produced a proper extent of dilatation, which could not have been much increased. I

soon became convinced that the tumor in this case was too large and distended the cheek too much to be removed without an external incision. My previous opinion, predicated on the facility with which I could manipulate the parts on the cadaver, was modified by the peculiar extension upwards of this growth, which made its anterior and upper surfaces less accessible to instruments than could be anticipated before the preliminary incisions of the gum. Reserving, therefore, this operative procedure for a case more favorable to its adoption, I promptly cut through the middle of the lip in its furrow, and extended the incision around and behind the right nostril, a short distance up the side of the nose. This incision, which is recommended by Ferguson, permitted me to complete the operation rapidly and with facility. The nasal branch of the maxilla was cut with Liston's bone-scissors, and the malar bone effectively severed with a metacarpal saw. An incision of the soft parts was then made along the posterior border of the palate bone, from the end of the alveolar arch to the middle palatine suture, and another at right angles to this incision, terminating at the alveolar of the left incisor, which was extracted. One blade of Liston's scissors was passed into the right opening of the bony nares, and the other into the mouth, and the palatine arch cut. The tumor was then wrenched out with a pair of Ferguson's lion forceps, and the remaining soft parts adherent to it were detached. One of the little palatine arteries, throwing out a fine jet of blood, was secured, after a little trouble, by a ligature; with this exception there was no trouble from hæmorrhage, but to guard against it considerable lint, some of which was saturated with a solution of Squibb's sub-sulphate of iron, was stuffed into the cavity left after the extirpation of the tumor.

The upper two-thirds of the external incision were united with ten or twelve silver wire sutures, and the cut surfaces of the lip were held in apposition with two figure-of-eight sutures. With the valuable assistance of Dr. Nathan Bozeman, now of this city, but late of Montgomery, Ala., this

external incision was very neatly, accurately, and securely approximated throughout its entire length. After the application of a light dressing to the part, the patient was conveyed to her bed, and half a grain of sulphate of morphia prescribed, to be taken at night. In a few hours the pulse commenced to rise, and in the night she had considerable fever.

January 3.—Early in the morning I found the pulse 120; strong and full. She could swallow without difficulty; took strong beef-tea every few hours, and her mouth was often mopped out with a weak solution of chlorinated soda, and occasionally with glycerine. She took a few times during the day an anodyne and diaphoretic mixture, containing sulphate of morphia and swt. spts. of nitre; had very little thirst; she became restless, and late in the night her pulse increased to about 130.

January 4.—I saw her early in the morning, and commenced to give her stimulants; very soon after swallowing about half an ounce of sherry wine, her pulse was lowered eight or ten beats to the minute. She took frequently during the day brandy-whey, and beef essence; and eight drops of muriated tincture of iron in solution were administered to her every few hours. In the middle of the day her pulse was 120 to 135, and about the same at my evening visit. The same mouth-washes were used as at last visit.

January 5.—She continued to take the beef essence and tincture of iron as before; but substituted sherry wine for brandy-whey. By means of a rubber syringe with a long pipe, the upper part of her mouth was washed out several times with tepid suds of Castile soap; afterwards with clear water, and then with water containing a drop or two of creasote. In the evening she was quite restless, had a hot dry skin, and her pulse was increased a few beats.

January 6.—I saw her at an early hour and found her much better; her pulse was only 96 to 100. Last night she was very uneasy and restless up to twelve o'clock; about that time she got rid of a lint plug which was annoying her;

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but soon afterwards she had a profuse perspiration, and improved rapidly. She told the attendants that she was glad that I would find her in the morning so much better. She complained of hunger, and drank her beef tea very gratefully. To-day the hare-lip pins were removed, and the union of the lip was found to be perfect. The same detersive and medicated injections were used as yesterday. She took some chicken broth, and continued to take the beef essence and tincture of iron. A gentle aperient having failed to move her bowels, they were slightly relieved by a suitable clyster.

January 7.—Rested well last night; this morning a piece of lint became partially detached and caused her some discomfort; I removed this piece, and one or two others, with a pair of dressing forceps; syringed out the mouth with Castile suds, clear water, and weak creasote water. Continued the same medicines and nourishment. At the evening visit I removed two or three pieces of lint.

January 8.—Took out all the silver sutures; washed the parts and put fresh isinglass to the lip and side of the nose, and removed all the lint plugs. I entertained doubts, as I had a few days before, whether the offensive suppuration caused by the lint, was fully compensated by the supposed security afforded against hæmorrhage by cramming the wound with this material. If all other necessary means for stopping hæmorrhage are made available, and the parts exposed sufficiently long to the air, I have no doubt that sometimes no lint would be required. It would be far better to have only the saliva, which is bland and unirritating, in contact with the surfaces of the wound, than lint. In a similar operation, about two years ago, which was attended with most excellent results, I abstained from stuffing lint into the cavity which remained after the excision of the tumor; and I believe that it would be well, if possible, always to adhere to this practice.

To-day she is able to sit up and syringe out her mouth herself; has very little fever; said at the morning visit, that she felt quite comfortable. Although I have requested her

to observe strict silence, she will occasionally address a sprightly remark to her sister, or utter some pleasant expression, indicative of her habitually cheerful disposition.

January 9.—She continues to improve; has a relish for food; took some soft boiled eggs this morning; uses the same mouth washes; discontinued the tincture of iron.

January 10.—Last night she was restless, and about eleven o'clock she had considerable fever; I was told to-day that once or twice before she has had fever during the night Fifteen grains of sulphate of quinia were prescribed to be given in clyster, but only a third of it at a time, and at three hours' interval.

January 11.—Doing very well; took in the same way as yesterday, twelve grains of quinine.

January 12.—She has not had a return of her fever; but the quinine was repeated once more.

January 18.—During the last six or eight days, she has been able to sit up and to walk about the house; and, if the weather were pleasant, could go out to walk. She went out this morning, in a closed carriage, and had her photograph taken, which compared with the one taken before the operation, exhibits a marked improvement in her personal appearance, effected by the operation that relieved her of this encroaching tumor. Desirous of having the deficiency of the upper-jaw, caused by excision of the tumor, repaired by some competent dentist, I made careful inquiry, and learned through a professional friend, that in a similar operation performed in 1842 by Dr. R. D. Mussy, of Cincinnati, on the patient Thomas McGilligan, Dr. H. Crane, dentist of this city, made a substitute for the upper maxillary bone which the patient had worn twelve years when last seen. The contrivance which the dentist Cook made, and to which Mussy refers in his publication of the case, was soon rejected by the patient as useless. Miss P. visited to-day the rooms of Dr. Crane, who is an ingenious and skillful dentist. With a little effort she can articulate quite distinctly; this is a very considerable advantage, and will aid in obtain-

ing an excellent result, when this gentleman makes for her an artificial palate and set of teeth.

January 23.—She left to-day for her home. About two weeks after the operation, she was well enough to leave, but was detained by snow storms, which interrupted railway travel. I have recently received a letter from her, dated February 6th, and will quote a few lines from it:

"I am improving very rapidly, my color has returned with my strength, and I am sure I have already gained several pounds in weight; the soreness has almost entirely left my mouth, and it is healing up very nicely."

April 3.—Miss P. has returned to New York to place herself under the care of the dentist. The parts are entirely healed; she is no longer subject to headache, and is in the most excellent health and spirits. The space left after the extirpation of the tumor, has closed up remarkably well; the entire soft palate is preserved; and the only opening in the roof of the mouth is an oval orifice about an inch and a quarter in its longest diameter, which is antero-posterior. The eye is well retained in its natural position, and its movements are free, and easily executed. There is some flatness of the cheek, and distortion of the right side of the mouth, which is obviously caused by the disuse af the muscles on that side of the face, which defect can probably be removed by the device of the dentist.

April 18.—Dr. Crane has been eminently succesful in accurately fitting to the young lady's mouth an ingenious piece of workmanship, composed in part of vulcanite, with a beautiful arch of teeth, and rose colored gums of porcelain, appearing so natural that they defy close scrutiny. This dental attachment, which she has worn several days, enables her to pronounce with perfect distinctness; it improves her appearance, and her mouth feels more comfortable with it than without it, as it causes not the slightest irritation or inconvenience; indeed it is a most remarkable triumph of the dental art, and has, I believe never been excelled. Having accomplished the object of her last visit to New York, she

is ready to return to her home, and now enjoys social intercourse with a zest which she rarely experienced before the removal of the tumor.

December 21st, 1869.—Patient in excellent health a few weeks ago—new plate adjusted to mouth by dentist—(Dr. C.)

Examination of the Tumor.—The tumor, after its excision, was heavy and hard, and appeared like a compact mass of hypertrophied bone, weighing four ounces and a quarter, and involves the superior maxilla and part of the malar bone. The greatest thickness of this growth is measured by its vertical diameter; its superior surface corresponds to the floor of the orbit, which before the operation, in being displaced upwards, diminished the orbital cavity in this direction to the extent of about half an inch. The inner fractured border of this surface corresponds to the lower border of the orbital plate of the ethmoid bone, from which the tumor was separated in wrenching it out. On the upper third of its anterior surface may be seen an indentation, corresponding to the external orifice of the suborbital canal, from which point may be measured with the eye the extent of encroachment of the tumor upwards. Its external surface projects quite prominently, and its inferior and posterior surfaces also exhibit considerable enlargement of the maxillary bone. A piece of the tumor was sliced out by sawing to its centre; and the internal structure of the mass was observed to be similar to that of the most compact bone tumor, and which is known as the ivory exostosis. Exceedingly fine sections of this piece were placed on slips of glass and successively examined, under the microscope, after adding a drop of glycerine to each delicate section, and pressing gently its thin glass cover. Numerous osseous lacunæ with their diverging canaliculi, were seen thickly studding the little masses within the field of the instrument. These osseous lacunæ were found to be present in each specimen examined, though not so numerous in some as in others.

The tumor seems to be formed exclusively of bone tissue,

and may be considered as a type of dense osseous tumors of the superior maxilla, and belongs to an interesting variety of benign growths.

Conclusions.—The growth is of a benign character. The origin of the diseased action in the bone is traceable to a contusion.

The upward extension of the tumor was peculiarly unfavorable; the mass invaded slowly the orbital cavity, and probably would ultimately have caused a protrusion of the eye and an encroachment on the brain.

My experience in this operation has been entirely favorable to the use of chloroform. As an excellent precautionary measure, it is well to give brandy in this as in all surgical operations, before administering chloroform; the brandy facilitates the action of the chloroform, and materially diminishes the chances of accident resulting from the depressing effects of this agent on the nervous system.

I believe that tumors of the upper jaw of a moderate size, when favorably situated, may be excised without an external incision of the face.

The incision in the furrow of the lip and up the side of the nose, offers peculiar advantages over other incisions of the face.

The structure of the tumor will influence the amount of hæmorrhage; causing it to be more or less dangerous and difficult to control, in proportion to the vascularity of the growth.

It is best, if possible, not to stuff lint into the cavity left after the extirpation of the tumor; leaving the parts to the bland and unirritating contact of the saliva.

An excellent substitute of vulcanite and porcelain may be made to repair the deficiency caused by excision of the upper maxillary bone; end thus the skill of the dentist may essentially aid in correcting the contraction of the parts after healing.

A removal of the entire floor of the orbit does not necessarily cause a falling of the eye; such was not the case after this operation.

ARTICLE IV.

Georgia State Dental Society.

By ARTHUR C. FORD, Recording Secretary.

Pursuant to the adjournment of the preliminary meeting of the Georgia State Dental Society, held in the city of Atlanta on the 30th of July last, it re-assembled in the Library Rooms of the Historical Society of Savannah at ten o'clock, A.M. President Dr. W. H. Burr, of Madison, in the chair.

Present, Dr. J. P. H. Brown, Cor. Sec., *Augusta ;* F. Y. Clark, *Savannah ;* H. A. Lowrence, *Athens ;* E. M. Allen, *Marietta ;* E. Parsons, *Sandersville ;* W. Johnson, *Savannah ;* A. M. Postley, *Savannah ;* H. I. Royall, *Savannah ;* E. L'Engle, *Savannah ;* C. A. Harley, *South Carolina ;* A. C. Ford, *Atlanta ;* Mr. Samuel Hape, *Atlanta.*

In the absence of the Recording Secretary, Dr. T. J. Crow, of Macon, Arthur C. Ford was called upon to act pro tem.

The minutes of the preliminary meeting being then read, were slighly amended and confirmed.

Dr. J. P. H. Brown, one of the committee appointed to draft a Constitution and By Laws for the Society, then submitted a report, which on being read by sections, was somewhat amended and adopted, and signed by all the members present, and two hundred copies were ordered to be printed. The Society then adjourned to meet at 7.30 P.M. of the same day for the election of officers for the ensuing year.

DECEMBER 28TH, 7.30 P.M.

Society met agreeable to adjournment of this morning.

On motion of Dr. F. Y. Clark, P. P. Lewis, of Fla. and C. A. Harley, of S. C., (being present), were elected corresponding members, and Mr. Sam'l Hape, of Atlanta, Geo., an honorary member.

Dr. U. Van Guisen, of Geo., being present, signed the Constitution as an active member.

The Society then proceeded to the election of officers, with the following result:

President,	Dr. F. Y. Clark,	*Savannah.*
1st Vice "	" E. M. Allen,	*Marietta.*
2nd " "	" H. A. Lowrance,	*Athens.*
Cor. Secretary,	" J. P. H. Brown,	*Augusta.*
Rec. "	" A. C. Ford,	*Atlanta.*
Treasurer,	" W. Johnson,	*Savannah.*

Executive Committee.

Drs. Burr, Parsons, Allen, Lowrance and Johnson.

Society then adjourned to meet at 9 A.M. tomorrow.

December 29th, 9 A.M.

Agreeable to adjournment the Society met. Minutes of yesterday read and approved. Dr. F. Y. Clark, the President elect, was then installed in the chair, and the other officers assumed their duties.

The various committees were then appointed by the President, as follows:

On Operative Dentistry:—Drs. Parsons, Johnson, and Ford.

On Mechanical Dentistry:— Drs. Van Guisen, Royall, and Postley.

On Dental Education:—Drs. Brown, Holland, and Allen.

It was then moved by Dr. Brown that delegates be appointed to the Southern Dental Association and the American Dental Association; carried and the following delegates appointed:

To the Southern Dental Association.—Drs. Holland, Lewis, Johnson, Burr, Royall and Mr Sam'l Hape.

To the American Dental Association.—Drs. Allen, Brown, Ford, Van Guisen, Lowrance and Mr. Sam'l Hape.

A resolution was then offered by Dr, Burr as follows; which was adopted:

Resolved:—That this Society instruct their Delegates to the American and Southern Dental Associations, to request said Associations to appoint committees to petition Congress to appoint Dentists in the army and navy of the U. S.

An interesting and instructive essay was then read, and received, by Dr. F. Y. Clark on "The Diseases and Treatment of the Dental Pulp," and the subject was then opened to discussion, and several members gave their modes of treatment, experience, &c.

A. C. Ford moved,that a committee be appointed to prepare a paper upon "The Care and General Treatment of the Teeth *for the People*," to be submitted to the Society at its next annual session, subject to their approval, for publication ; adopted and Drs. Brown, Holland and Ford appointed.

Various other committees were then appointed for local purposes, and the Society adjourned to meet at 7.30 P.M.

DECEMBER 29TH, 7.30 P.M.

Society met agreeable to adjournment. Dr. Holland, of Augusta, being present signed the Constitution.

Moved by Dr. Allen that the Society now designate the place and time for the next session, carried. After some discussion, Atlanta, Geo., was selected, and the time Thursday, July 28th, 1870.

Moved by Dr. Allen that the Recording Secretary be instructed to furnish the *American Journal of Dental Science* with a synopsis of the proceedings of this Society, carried.

The President appointed Dr. Ford and Mr. Sam'l Hape, as committee of arrangements for next session.

After some further interchange of opinions, &c., on dental subjects, the Society then adjourned to meet in Atlanta, Geo., on Thursday, July 28th, 1870, at 10 o'clock, A. M.

SELECTED ARTICLES.

ARTICLE V.

Periodontitis.

By J. FRED. BABCOCK, Bangor, Maine.

A lady called at my office, during the past summer, very anxious to have me go and see her sister, who, she informed me, had been confined to her bed for the past four days,

suffering with an exceedingly severe toothache. This was upon Friday forenoon, and upon inquiry I learned from this lady that her sister had experienced the first attack upon the previous Tuesday. On the following day she was taken to a dentist for the purpose of having the operation of ex traction performed. He, however, said he could not find any apparent cause for the pain; but, probably acting upon the principle that, "nothing venture, nothing gain," he proceeded to extract the second bicuspid tooth, which had been previously filled with amalgam, but which, since the opera- of filling, over a year before, had given her no pain. Owing to the loss of blood consequent upon the operation, she experienced complete relief for about an hour, when the pain again returned even more severely than before, and she again had recourse to this dentist, who, upon responding to her call, informed her that he could only afford relief through the extraction of all of her upper teeth. To this proposition she would not consent, when he endeavored to quiet her with chloroform, and also with morphine, but without success. At this stage I was called in, and upon reaching her bedside found her very pale, her left eye very badly inflamed, and already much emaciated with the intensity of her sufferings for the past three days. She was moaning piteously, and with an occasional shriek, as a spasm of pain would traverse the nerves in the side of her face, would beg to be relieved from her misery. For ninety six hours she had not obtained sleep, and could only secure temporary relief through taking ice water into the mouth and instantly spitting it out again, then immediately repeating the operation. This she was obliged to do so often, that in the course of twenty-four hours she would, in emptying the water from her mouth, fill an ordinary wash bowl some five or six times; in fact, so often was she obliged to sip the water that it was with the greatest difficulty that I could make an examination of her teeth; but, after some perseverance, I partially succeeded, and upon concussion with an instrument I found four teeth, the periosteum upon the roots of which were

highly inflamed, viz: the canine, first bicuspid, and the first and second molars, (the second bicuspid gone), all upon the left side of the median line. These teeth, with the exception of the canine, which was filled with gold, were filled with amalgam. I endeavored to make local treatment, but fonnd ti to be utterly impracticable, owing to the fact that the constant severity of the pain made it imperative that she should have the ice water in her mouth continually. Finding it impossible to resort to the usual measures, I gave her a teaspoonful of the following prescription:

℞.—Quinine, sulph., ʒ ss;
Acid, sulp. aro., ʒ ij;
Elix. calisaya bark, ʒ xiv.—*Mix.*

When almost instantly the pain ceased, and for some three minutes she experienced entire relief; whereas, before it had been *unremitting.* At the end of this time it returned, but with abated force, and before I left her, which was in the course of an hour, the paroxysm were very much less frequent, (this was at 12 o'clock, M.) I left the medicine, with orders that the dose be repeated at 2 o'clock, P. M., and upon returning, at 3 o'clock, I found her comparatively comfortable, but having an occasional twinge of pain about once every fifteen minutes. The water had been entirely discarded, and her gratitude to me for what relief I had afforded was very marked. Morphine powders were left for her to take, and upon calling the next day I found that she had slept soundly, and since the night before had had scarcely any pain. I now made a more satisfactory examination; the teeth were still quite sore, and no reason was found to change my previous diagnosis. Upon the day following she was brought to my office, when I applied three leeches to the gum, distributed directly over the teeth affected, and made a free application into the wounds of tinct. of capsicum; this treatment was again repeated in about six hours, only that, instead of leeching, the lance was used freely. It was repeated the following day, when I pronounced my patient cured; for all pain had ceased, and the teeth were not more

than ordinarily sensitive to the quite heavy concussion of the large end of a plugger. This was six months ago, and quite recently I have learned, by personal inquiry, that the lady has not been afflicted since. It only remains for me to add that I could not trace this inflammation of the peridental membrane to any apparent cause; but it was probably the result of a very severe cold which she had but recently acquired.—*Dental Times.*

ARTICLE VI.

Necrosis of Nearly the Whole of the Lower Jaw—Removal of the Dead Bone, Including one Condyle—Recovery with Perfect Movement of the Jaw.

(Under the care of Mr. Christopher Heath).

Egbert H., aged 22 from Aylesbury, was sent to Mr. Heath by Mr. Ceely with necrosis of the lower jaw.

In August, 1868, he had typhus fever in Walsall Union, and during the attack the face became swollen, and discharged both externally and into the mouth. His teeth were all loosened, but none were extracted. In December he was passed on to Aylesbury, and came under Mr. Ceely's care.

On February 24, 1869, patient was admitted into, University College Hospital under Mr. Heath's care. The right side of the lower jaw was immensely swollen, and two inches below the angle was a sinus through which a probe passed up towards the base. Another sinus existed below the right canine tooth, and there had been a third below the left angle which was now closed. The teeth were all more or less loose, and there were several openings in the gums, from which a most offensive discharge passed into the mouth. The man was well nourished and otherwise in good health, though he had when a child suffered from hip disease. On the day of admission, under chloroform, Mr. Heath extracted the molar teeth of the right side which were loose, and, having divided the gum, extracted a very large sequestrum,

comprisng the right side of the body of the jaw from the canine tooth to the angle, and containing the mental foramen. The hæmorrhage was very free, but was checked by plugging the shell of new bone from which the sequestrum was taken. The plugs were removed on the second day, and the mouth syringed out daily with disinfecting lotion.

On March 3, 1869, under chloroform, Mr. Heath cleared out some small fragments of necrosed bone left in the right angle of the jaw, and then proceeded to remove the necrosed portion on the left side, which extended as far as the second molar tooth. Mr. Heath attempted to save the incisor teeth it appearing at first that the alveolus of that part of the jaw was not involved. It proved, however, that the disease had affected the whole thickness of the bone, and the teeth were necessarily sacrificed. Upon removal of the sequestrum there was left a complete framework of new bone, with a deep groove extending from the right angle (which was quite hollowed out) to the second molar tooth of the left side. The mouth bled freely, but this was checked as before by stuffing with lint. The patient made a good recovery, and was able to return to the country in a week, the discharge having almost entirely ceased, and there being a deep groove in the new structure of the jaw from which the sequestrum had been extracted.

On June 16 the patient returned, there being a portion of diseased bone on the right side. This Mr. Heath extracted, under chloroform, with some difficulty through the mouth, when it was found to include the angle and a great part of the ramus of the jaw. From this operation also the patient made a speedy recovery, and returned to the country, and was not seen again by Mr. Heath until October, when he returned with yet more necrosis, involving the remainder of the right ramus. This was removed with difficulty on October 30, and the man has not since suffered from pain or discharge, so that it seems that the whole of the dead bone has now been taken away.

Perhaps the most singular feature in this case is the fact

that the man has now (December) as perfect movement of the jaw as if no disease had existed, notwithstanding that at the last operation the whole of the right condyle was removed entire with about a third of the ramus. The repair has, in fact, been as complete as possible. When we saw the patient five weeks after the last operation, there was some fulness and prominence about the right angle of the jaw, and when the mouth was widely opened the lower jaw was drawn slightly to the right side; but otherwise all the jaw movements were perfectly performed without any pain or inconvenience, a deep groove in the gum, reaching from the right angle to the second left molar, alone remaining to show the former seat of such extensive disease.—*London Med. Times and Gazette.*

ARTICLE VII.

Treatment of Tooth Pulps.

By J. G. Willis, M.D., Cincinnati, Ohio.

No complication attending the decay of teeth has given the profession more trouble than the exposure of their pulps. Its consideration has added largely to the literature of our Dental journals, and has afforded the widest field for the display of purely scientific ability of those members of the profession, who have seen fit to make public their views, and the practice formed thereon.

The gravity of this complication can not be easily overestimated, and notwithstanding the extensive consideration which the subject has elicited, through the journals and societies in all sections of the country, there is no settled course of procedure recognized by the profession, as being preferable to all others. The methods of treatment when the same result is desired to be obtained, are as diametrically opposite as the results themselves—the life or death of the pulp.

Heretofore the question has been how best to save a *tooth* after a pulp was exposed, and the earliest means adopted

for that purpose frequently, if not always, resulted in the death of the pulp and ultimately, if relied on solely, in the loss of the tooth itself, from ulceration, abscess and internal decay. The propriety of destroying exposed pulps under any circumstances, I will not at this time consider, except incidentally, as a complete exposition of the subject would consume more of my time than at present I can spare.

But the best practice—and the best because the most successful—in cases of exposed pulps, when their death is decided to be imperative, has not yet been agreed upon by the profession, and therefore the practice in such cases is widely variant, and results as widely. That the profession may have another method of practice in such cases, from which to select, I will, as briefly as the subject will admit, give mine in detail, and the reason therefor. I use arsenic for the devitalization of the pulp—the usual formula, viz: arsenic, creosote and morphine—before applying to the pulp I clean out the cavity of decay, as thoroughly as possible, and with the excavator locate the opening into the pulp cavity, and enlarge it as much as the patient will allow. The removal of decayed and discolored dentine allow a better view to be had of the cavity, and enlarging the opening into the pulp cavity insures a more thorough application of the destructive agent. I make the preparation very *thin* with creosote before using, and saturate a pledget of cotton, and press it directly upon the exposed pulp; this pressure usually causes some pain, and the pain is a sure indication that you have made the application at the right point; therefore, if no pain is complained of, I continue to move the cotton around until the outcry of the patient notifies me that I have hit the spot. I continue a moderate pressure for a minute or so to give the preparation time to insinuate itself between the pulp and the walls of its containing cavity. The fluidity of the preparation renders this a matter of no difficulty whatever, and the death of the pulp is rendered much more certain, than where the preparation is used thicker. I rarely have to make the second preparation, and never, ex-

cept in cases in which the exposure is small and can not be increased by reason of pain. I then, with another pledget of cotton, absorb the surplus creosote, and stop the cavity with *wax*, and I endeavor to press the wax in the direction of the exposed pulp, so as to be sure that the latter is not moved from its contact with the opening into the pulp cavity. This usually also causes some pain, which assures me everything is all right. I direct the patient to allow the wax to remain four hours, and four hours *only*, when they are to remove it and the cotton, and return next day.

After considerable experimenting, in which my object was to find the shortest possible time required to kill a pulp, I have settled upon four hours, and with a reasonable amount of exposure, will not fail once in fifty times to produce the desired result. Again, I do not think it proper to hermetically seal the cavity of decay, for the gases and fluids—the products of decomposition of the pulp—must find exit at some point, and if prevented from escaping through the crown, will be forced through the apical foramin, and irritation, congestion and inflammation of the investing membrane of the root will be the result, and if left sufficiently long, abscess will be the *inevitable* result. Above all things, then, I caution all to never hermetically seal up a cavity, in which there is an agent destructive to the pulp.

Here it will be proper for me to say that if I could always do as I choose, I should extract the pulp mechanically; but as people will not consent to that operation, we have to select another. At the next sitting of the patient I enlarge the opening, and very generally without pain, and expose thoroughly the root canals. If I find some tenderness in the extreme ends of the roots, I am not at all sorry, for by that I shall be assured that the effects of the preparation have not gone beyond the tooth, but are confined within its cavity. Frequently blood will escape from the canals; when this is the case, I regard the operation as in the same stage, as though the pulp had been mechanically extracted, and the object to be accomplished the same, viz; the healing of the

divided pulp and the closure of the foramin. I seldom use the barbed nerve extractors, but when I have used one and safely removed it from the canal, I thank my stars that it did not break, and if I had then always thrown it away, I should have been saved great trouble from its subsequent breaking. They are bound to break sooner or later, and therefore should not be used once *too* often. I am exceedingly careful not to force an instrument through the apex of a root, as frequent failures result from this cause alone. And I never use a drill in a root; as from the frequent deviations of canals from straight lines, drills are often driven through the root against the alveolus, and this accident makes a failure inevitable.

I have seen three teeth, the extraction of which was made necessary from this cause. In one of them cotton, and in another gold projected beyond the tooth, while the third could not be got into a condition to fill, and when removed the reason was plainly apparent. These accident all happened in the practice of as good Dentists as the country affords, and should be a warning to all when they attempt to use drills in such places.

After removing all the *debris* of the nerve I dry out the canals as thoroughly as possible with cotton, drawn out into a fine thread, slightly twisted, and carefully forced into the canals. I then saturate a similar thread of cotton with creosote, and lightly force it into the root, leaving the end to project into the cavity, that it may be easily removed. Close the cavity with wax and direct the patient to call the next day. On the next visit I remove the cotton from the roots, again explore them thoroughly and make another application of creosote, as before, always being careful not to force creosote through the root, my object being to close up the tubuli and destroy any septic matter in the canals. The divided pulp will heal readily and entirely close the foramen, and no fear need be apprehended of any fluids finding their way into the canal, whether plugged or not. Many Dentists labor under the delusion that the object of filling the root

canals is to prevent the accumulation of fluids in them; if there should be any fluid of any description, whatever, which would drain into the canal, if not filled, the preventing of that drain would insure peri-cementitis, and perhaps loss of the tooth. At the next sitting of the patient, after removing cotton and thoroughly cleansing the canals, I force a very small thread of cotton, saturated with creosote, into the root as far as I can, absorb the excess of creosote, and fill the root canal, or not, as is most desirable; if small, I just fill their mouth, if larger, I generally fill them through their whole extent.

If a tooth is not to be filled as soon as it is in a condition to be so *safely*, the crown cavity must be sealed up with something, to prevent the access of fluids of the mouth to the root canal. I use Hill's stopping for this purpose. I often fill the roots and then wait for a day or two to observe result; if no trouble supervenes, I fill the crown cavity with complete confidence that there is perfect immunity from danger. A tooth is made sore sometimes by forcing threads of cotton into the canals too tightly, thereby preventing any drain which may come from dead tissue; this can only be done with safety after all foreign matter is removed from the root, or is converted into an indestructible compound by action of creosote. Whether a tooth is in a condition to be filled or not, may be determined by fillling the crown *only* with Hill's stopping. If there be any discharge it will soon manifest itself by uneasiness in the tooth, when the stopping should be removed and creosote again applied. Many Dentists charge upon arsenic all the soreness that follows its application to an exposed pulp, but they forget that the same degree of soremess may be produced in a tooth with the pulp already dead, by filling the crown tightly, and the same result occurs in both cases from the same cause, with which the arsenic has nothing to do, except to produce the condition upon which decomposition depends. The above practice has been so thoroughly satisfactory in my hands that I feel warranted in assuring all

who will follow it, that they need not lose a tooth treated in accordance with it, unless complicated by themselves. I have treated about fifty teeth with exposed pulps in this manner, during the last year, and have not had a complaint from one of them, and without a failure in a single instance. A ratio of success that can not but recommend the practice to all. I sincerely hope that this article may be the means of shedding light, and that by reason of it, some teeth may be saved which would otherwise be lost.—*Dental Register.*

ARTICLE VIII.

Case of Fibroid Tumour of the Upper Jaw.

Dr Ashhurst exhibited the specimen, and read the following history before the "Pathological Society,"

R. H., aged 17, a native of this country, and an iron-worker by trade, was admitted to the Episcopal Hospital on Jan. 20, 1869. It was impossible to obtain any satisfactory account of the previous history of this case, but we learned that he had noticed some obstruction of the right nostril for several months, and latterly the cheek had become swollen below and in front of the malar protuberance. On examination the hard palate was found depressed, and in one part much thinned, so that the presence of fluid above it was easily recognized. There was no enlargement in the region of the canine fossa, no encroachment upon the orbit, and scarcely any on the nostril. It was evident that there was dropsy of the antrum, and the swelling of the cheek—which the patient said was not constant—was supposed to be either due to inflammatory thickening, or possibly a new growth unconnected with the maxillary affection. A trocar and canula were introduced through the bulging fluctuating surface of the hard palate, and a considerable quantity, probably a fluid ounce, of serous fluid deeply tinged with blood, evacuated with immediate relief to the symptoms.

The amendment in the patient's condition was, however, of but short duration, and in the early part of February

profuse hæmorrhage from the posterior nares occurred on three several occasions. He now mentioned (a fact of which we had before been unaware), that similar hæmorrhages had occurred before he sought admission to the hospital. Examination at this time revealed the existence of a solid tumour, the presence of which when smaller had been masked by the fluid accumulation in the antrum. It was now perceived that the entire alveolar border of the jaw was displaced downwards and outwards, and the finger introduced behind the soft palate recognized a tumor projecting backwards into the pharynx. The soft palate itself was manifestly depressed by the superincumbent mass. No connection could be traced between the maxillary tumour and the swelling in the cheek, which I thought I could isolate from the larger mass, getting my finger as I supposed behind and entirely around it.

As the patient was rapidly becoming anæmic from repeated hæmorrhages, and as the dyspnœa was constantly increasing, it was evident that operative interference was urgently demanded. Accordingly, on Feb. 18, with the approval and assistance of my colleagues, I removed the greater portion of the right upper maxilla (leaving only the orbital plate, which was perfectly normal), and then proceeded to enucleate the tumor with its several ramifications as rapidly as possible. The external incisions were through the median line of the lip along the ala of the nose, and transversely below the orbital ridge. The vessels of the flaps were tied as they were divided. The bone sections were made with strong cutting pliers, and the jaw as well as the deep-seated portions of the tumour wrenched out with the "lion-jawed" forceps of Sir Wm. Fergusson. The last portion enucleated brought with it a bulbous mushroom-like projection, which proved to be the tumour that had been felt in the cheek. The whole growth was very vascular, and a great deal of blood was lost during the latter stages of the operation. The lips of the wound were approximated and the patient rallied from the chloroform anæsthesia suffi-

ciently to answer questions, but never fairly reacted, and died about two hours after the operation.

The specimen shows the greater part of the tumour and the portion of jaw removed. The antrum is greatly enlarged. The morbid growth appears to have originatep from the posterior wall of the antrum, pressing down the hard palate, and partially displacing the alveolar ridge; it seems then to have escaped into the middle meatus of the nose, and to have grown rapidly upwards (towards the sphenoid and ethmoid bones), backwards into the pharynx, and finally to have crept outwards through the pterygo-maxillary fissure, making its appearance below the malar bone, in the soft structures of the cheek. The tumour, under the microscope, showed a large number of small vessels, with fibres, cells, and free nuclei. Even in its present state, shrunken from preservation in alcohol, the tumour is the size of a hen's egg, and before removal, when distended with blood was very much larger—much larger, I may add, than any of us supposed before beginning the operation.

I may perhaps be pardoned for alluding to one or two points of clinical, rather than pathological, interest. The unfortunate result in this case, was I think, manifestly due to the combined effects of shock and hæmorrhage. The patient was under the influence of chloroform for a considerable time (and very thorough anæsthesia is requisite for operations on the jaw), but it is to be remembered that without anæsthesia, such an operation would be well nigh impossible. The immediate proximity of the tumour to the base of the skull is a very serious complication, and has not unfrequently been the cause of rapid sinking after the operation. This occurred in a case of Liston's. (*Erichsen's Surgery*, p. 863.) Mr. Hewet attempted to remove a fibrous tumour from behind the jaw by what has been called osteoplastic resection; the patient died before the operation could be terminated. (*Med.-Chir. Trans.*, vol. xxxiv. p. 43.) Quite recently, Sir Wm. Fergusson in an operation for tumour connected with the upper jaw, found the hæmorrhage so pro-

fuse that, to prevent a similar untoward result, he thought it better to close the wound, purposing to conclude the operation on another occasion. (*Med. Times and Gazette*, Aug. 22, 1868.) Careful and repeated consideration and criticism of the case I have just narrated, have failed to suggest any plan by which the operation might have been rendered more likely to terminate well. Sir Wm. Fergusson's plan would not have answered in this case, for the tumour itself was so vascular, that to leave any portion in position, would have exposed the patient to an almost certainty of continuous bleeding. Ligature of one or both common carotids would of course be out of the question. Possibly, had the operation been done earlier, the patient being less anæmic at the start, and the tumour smaller, a more favorable result may have been attained. The case was one that gave me a great deal of anxiety and care during the whole time it was under my observation, and, I think, should be placed on record, if for nothing else, as an illustration of the difficulties of diagnosis and the risks of treatment in all cases of tumour connected with the upper jaw and the base of the skull.—*Am. Jour. of the Med. Sciences.*

MONTHLY SUMMARY.

Death from Inhalation of Bi-Chloride of Methylene.—An actor of some repute, Mr. Chas. Verner. aged 39 years, admitted into Charing-Cross Hospital with a malignant disease of the upper jaw, from which there seemed but faint hope of recovery, without or with operative interference, decided to take the chances of an operation, and on October 15, 1869, after due preparation, the bi-chloride of methylene was administered with care and skill. Within two minutes of its administration and before the operation was commenced, the patient fell back and died. The galvanic apparatus and other appliances were resorted to, but life was extinct. An inquiry seemed to indicate the result as one of those occurrences which no human agency could prevent. —*Med. Press & Circular.*

The Artificial Leech.—Mr. Stohlman, of the firm of Tieman & Co.. of New York, has invented what he terms the artificial leech. The apparatus consists : 1st, of a handle about six inches long, in which is concealed a knife that is operated by a spring the knife revolving with great rapidity, as soon as the " trigger" is touched, and making a painless incision about a quarter of an inch in diameter; 2d. of any desired number of small glasses, with a capacity each of one or two fluid ounces; by placing a few drops of ether in one of these glasses and plunging the glass into warm water, the contained air is rarefied and expanded; the glass is now applied over the incision made by the knife and the air cooling down a vacuum is created and the blood in requisite quantity is easily drawn. The instrument is inexpensive, and will doubtless be useful, where leeches can not be obtained, or where they can not well be applied. Many have a repugnance to the leech that is incredible. In all such cases, this instrument will be useful and it is certainly very convenient.—*Richmond & Louisville Med. Journal*

Three New Anæsthetics—Iodal, Bromal, and Bromiform.—Scarcely has the name of chloral become familiar to the scientific world, when three new substances of the same character are announced by Dr. Rabuteau, of France (*Gaz. Hebdomadaire*, Oct. 22). Iodal is produced by treating iodine with alcohol and nitric acid. Bromal differs from chloral in having the chlorine of the latter replaced by bromine. Bromiform is made by decomposing bromal with potassa. In its chemical and anæsthetic qualities it is very analagous to chloroform and may be mistaken for it. But chloroform makes a violet colored solution of iodine, while that of bromiform is a magnificent carmine. Dr. Rabuteau is inclined to place the latter before chloroform. He thinks it will produce anæsthesia without a sleep so profound and dangerous. Bromal is irritating to the nose and eyes. Iodal has the same effect. The latter is unmanageable in consequence of boiling at 77° F. Injected in the rectum of a dog, it produced anæsthesia, followed by convulsions and death. The breath of the animal was strongly impregnated with the odor. The blood was found black, the flesh red, the spinal marrow and brain congested—presenting the same toxic effects as chloral.—*Pacific Med. & Surg. Journal.*

Death from taking Chloroform into the Stomach.—Dr. E. Fitzau (*Deutsche Klinik*, 1859, No 21) relates the case of a physician, 57 years of age, who swallowed 90 grms. of chloroform; he commenced immediately to stagger, like one intoxicated. After vomiting he sank into a deep stupor, attended with severe anæsthesia; his skin was pale and tolerably warm; his muscles were relaxed; his respiration short, and the action of his heart weak and intermittent. After the use of the stomach pump and different excitants, the epiglottis being depressed to prevent impending suffocation, an elastic tube was passed into the trachea, and immediately respiration became more free, and in about 14 hours sensibility returned. An acute gastritis became developed and rapid collapse ensued, and terminated in death at the end of 29½ hours from the time the chloroform was taken.—*Centralblatt f. d. Med. Wissenschaft.—Am. Jour. Med. Sciences.*

Epileptoid Convulsions caused by Carious Teeth.—By John W. Booth, M. D., of Tally-Ho, N. C.

October 7th, 1868, I visited an unmarried lady in an adjoining county in consultation with a respectable physician of that counf ty. She had epileptoid convulsious affecting principally some o- the muscles of the neck and the right arm. These attacks had been of almost daily occurrence for four years. She had nearly continuously during this time taken many and various remedies empirically, the cause of her affection not having been ascertained, without the slightest appreciable benefit. There was a very slight disposition to anæmia, and beyond this, there was not a symptom upon which to base a diagnosis or therapeutic indication. Appetite. digestion, general health all good, circulatory and generative apparatus acting normally.

In giving the history of her case, she stated that her first spell came on during an attack of toothache. Upon examining her mouth we found half a dozen carious teeth, and determined that to extract those teeth would afford the best chance of relief. Accordingly all the carious teéth were promptly extracted. There has been no return of the convulsions since. This lady has now improved considerably in flesh. and presents no anæmic phenomena. I need hardly add that her spirits are improved in an equal degree.—*American Jour. of Med. Science.*

Substances Eliminated in the Breath.—In answer to a "youthful phy.iologist" we desire to state that various substances besides carbonic acid are eliminated in the breath; such as chloride of sodium, nitrogen. hydrochlorate of ammonia, urate of soda, and urate of ammonia. In addition to these, the carbonate of ammonia is frequently, and carburetted hydrogen occasionally found in the breath; the former derived from decomposing matter in or between the teeth, the latter from the blood, into which it has entered from the alimentary canal. But besides the matters just mentioned, many odorous substances may exist in the breath, such as alcohol, the volatile principles of garlic, onions, and spices, camphor, ethers, chloroform, musk, and many other medicinal substances.

No specific name has been given to the organic matter found in the breath. It is known simply as "the organic substance in expired air." The substance in question is detected by passing expired air through strong sulphuric acid. It is albuminoid in constitution, has a fetid odor when accumulated in small and overcrowded rooms, and when allowed to putrefy, it becomes insufferably offensive. It has been suggested that this organic substance may be the medium or vehicle of certain contagions thrown off by the breath.

As to the circumstances under which the breath passes luminous from the nostrils, we reply that, when "phosporous is dissolved in oil and injected into the veins of an animal, it is given off by the lungs in some imperfectly oxidized state, so that the breath is luminous as it passes from the nostrils."—*Am. Eclectic Med. Review.*

Irregular Dentition and Caries of the Lower Jaw.—Dr. Pooley at the New York. Pathological Society, presented a small portion of the lower jaw removed by operation from a lady thirty years of age. The dentition of the patient had been very irregular; two of the second teeth of the lower jaw had never appeared, and the others that did were so uneven and deformed that they were extracted to make room for artificial ones, About a year ago she received a blow upon her chin, which was followed by considerable tenderness of the part, thought by her, however, to be principally due to pressure of the plate. Soon a

couple of sinuses formed through which dead bone could be detected. An incision was made upon the part, with a view of removing the necrotic tissue. No loose bone was discovered, and the bare portion was removed by the saw and bone forceps. Two of the principal portions that were taken away contained, imbedded in their substance, a partially developed incisor, which as the result of the iritation caused by the injury, were the foci of the bone disease.—*Med. Record.*

Toothache Amongst the Ancients.—One by one our illusions as to the "good old times" vanish. Long had we cherished an idea that at least decayed teeth were unknown to our hardy ancestors, and were the peculiar privilege of our frivolous civilisation. Mr. Mummery, in an able paper before the Odontological Society, has shown, however, that teeth were at times unsound even when the ancient inhabitants of the British islands lived on coarse meal or the produce of the chase. Mr. Mummery has examined all the ancient skulls within his reach in order to determine this point. Beginning with the long-headed race, who are the earliest known human inhabitants, and have been supposed to be of a Basque type, be found few instances of real decay, not many of wearing down, and none of dental irregularity amongst sixty-eight Wiltshire skulls; whilst amongst the round-headed skulls from the same county, supposed to belong to the later Belgic immigrants whom Cæsar found in possession of the southern part of the island, there were many more cases of caries, more also of wearing away, and some of irregularity, which Mr. Mummery believes to be indicative of a coarse vegetable diet and scarcity of animal food. Oddly enough, in Yorkshire the skulls of the earlier or long-headed race exhibit many signs of dental disease, both caries, wear and tear, and signs of abscess. As for the Romans in Britain, the practice of burning their dead makes collecting of skulls by no means easy, yet out of 143 Britanno-Roman skulls 41 had carious teeth; irregularity and abscess were also common, but not wearing away. No traces of stopping or of artificial teeth have been found. Amongst Egyptian skulls wearing of the teeth is very common from the gritty, sandy character of the flour, and caries is by no means unfrequent. There are no traces of stopping, and it seems that

the art of dentistry was almost confined to the extraction of teeth. Mr. Mummery's conclusion is that dental disease is not the exclusive privilege of a high state of civilisation.—*London Med. Times and Gazette.*

Excessive Opium Eating.—Dr. A. T. Schertzer, of Baltimore, Md., relates the case of a lady, twenty-eight years of age, who had consumed in two years, *five thousand eight hundred and forty ounces* of laudanum, and spent *eleven hundred and sixty dollars* in purchasing it. Without pretending to hold her attending physician to an unjust responsibility, the question naturally occurs, as to whether or not this heroic consumption and lavish expenditure might not have been prevented by the employment of judicious means, in the first instance? Medical men should always bear in mind that this dangerous habit is easily acquired and should guard as far as possible against it.

"While attached to the Medical Corps of the Navy," says Dr. S., "I have frequently met with natives of the East Indies who consumed opium with a voracity equal to that of the lady in question, but have never known a similar instance in this country."—*Med. and Surg. Reporter.*

EDITORIAL DEPARTMENT.

The Use of an Amalgam of Mercury and other Metals in Filling Carious Teeth.—Under this heading H. M. Bowker, Esq., of Montreal, Canada, publishes the following article in the *Canada Medical Journal*:

"This compound of mercury, with other metals, has many names given to it, such as *Royal Mineral Succedaneum*, *Enamel Cement*, *Bone Paste*, *Diamond Cement*, *Lithodion*, and many others changing with the fancy and policy of the operator. Under whatever name it may appear, it has the same base article, mercury, for its principal ingredient. I know of no practice so destitute of merit, but which, at the same time, appears to have more apparent advantages than that of filling teeth with mineral paste; especially to those who are ignorant of its composition and tendencies. It is well known that mineral paste in the mouth of some patients, is productive of not only severe local disease, but the constitutional effect is such as to endanger even life. I need not refer you to the principle laid down by every chemical authority that the tendency of metals to oxydation is much increased by being alloyed. It is a question with the highest dental as well

as medical authorities, whether the presence of an equal quantity of free mercury would be more pernicious than the presence of amalgam and silver, on account of the highly acid state of saliva, not only in active disease, but in some instances where there is but slight apparent deviation, from health. It is possible that there may be persons who can, with impunity, allow this "mineral paste" to remain in the mouth for a time; but there are others who cannot do so even for a few days, without leading to swelling of the glands about the tongue, throat, and neck. Neuralgia about the jaws, face and temples, even salivation and paralysis, have been produced in systems highly susceptible to the influence of mercury; for such is the difference in the idiosyncrasy of individuals, that a grain of mercury will with some, cause severe local as well as constitutional effects, whereas, with others, it requires many grains to affect them at all. I have frequently removed fillings of this "mineral paste" weighing twenty, thirty, and even forty grains, more than one half of which was mercury.

We must bear in mind that mercury and silver unite in but one proportion, and that any excess of the mercury is in a free state. When the mixture is subjected to the highest pressure in order to remove the free mercury, the amalgam then contains a preparation of sixty-four parts of mercury to thirty-six parts of silver. Such being the case, it becomes a question of great importance to know whether the oxide formed by this compound does not unite with some one of the acids or the fluids of the stomach, or of the saliva, when the system is in certain diseased conditions and form a salt of mercury which, in its mildest form, is nothing more or less than calomel. The result of the union would just as likely be corrosive sublimate as calomel.

Soon after the formation of the American Society of Dental Surgeons, which was composed of men who, for their scientific attainments and practical skill, were unsurpassed, a resolution was unanimously carried to the effect that "this Society regard the use of 'mineral paste' for plugging carious teeth as malpractice." A similar resolution was passed by the Medical Society of New York.

I know of many patients who have been treated by their physicians for certain diseases caused by amalgam plugs in the mouth, when neither the physician nor the patient suspected the cause. Many cases of what are called "Spontaneous Salivation," have been produced, and are the legitimate result of the presence of amalgam plugs in the teeth, for as soon as the mouth is relieved of the pernicious compound, all the unfavorable symptoms pass away, therefore, no further doubt can exist respecting the cause of the malady.

The question is often and naturally asked why this amalgam is so generally used by a certain class of dentists.

The answer can be found in one or all of the following explanations:

1st. The cheapness of the material.

2nd. The ease and facility with which it is used; for it can be put into the most difficult cavities with as much ease as so much putty or wax.

3rd. It makes up for the want of skill and ability to use something better.

4th. From ignorance or the want of honesty.

Were it not for these objections and others which might be given, I would unhesitatingly make use of the "paste" in my own practice, for by so doing, I should save labor, time, money, and derive as much profit and advantage as those who persist in using it. But if it can be proved that this mineral paste is constitutionally injurious, in any single case, its use should be abandoned by all who take an interest in the standing of their profession, or have any regard for their reputation.

It is with much reluctance that I appear as the expositor of the abuses of dentistry: But were I to remain silent, I should consider it would be a violation both of duty and conscience, and when I see an institution, such as exists in Toronto, with the imposing title of the "Royal College of Dental Surgeons," encouraging the use of such a pernicious compound, and that the same may be said of the "Dental Association of Quebec," I think it time that the public should clearly understand the risk the patient runs by the use of it. As I have remarked, the highest dental and medical authorities, both European and American, have condemned the use of amalgam, in any form whatever, for filling teeth, as malpractice. Yet in spite of this positive dictum the Dental Societies of Canada, who put themselves forward as the guardians and representatives of the profession in the Dominion, not only advocate but vindicate its use.

The question in its effects becomes medical, and clearly within the sphere of the journal under your direction; therefore I respectfully ask the assistance of the leading members of the faculty to discountenance what has been proved to be a most pernicious practice."

This article is somewhat severe upon the "Royal College of Dental Surgeons" and the Dental Societies of Canada. Who Mr. Bowker is we do not know, perhaps the *Canada Dental Journal* can enlighten us; but whether Mr. B. is qualified by professional experience and investigation to make a report upon this subject or not, much that he says is true, but at the same time we think that he has taken an extreme view of the case.

Although no advocate for the indiscriminate use of amalgam, and believing that tin-foil is much superior as a cheap material for filling teeth, yet we think this compound may be used in teeth

which are mere shells, so far gone that no other metal can be safely introduced, and that it will preserve such teeth for a time at least, especially where their extraction is contra-indicated for some good reason.

On the other hand such fillings should never be used in teeth which it is possible to fill with either gold or tin-foil; and in no case should amalgam be used in front teeth, or in the pulp cavities of teeth, or in the proximity of a living pulp.

When properly prepared and properly introduced, instead of amalgam fillings containing sixty-four parts of mercury to thirty-six parts of silver, as Mr. B. asserts, the proportion of mercury need not, and should not be half so great.

The objections urged against this compound in Mr. B.'s article would certainly hold good, if the amalgam used at the present time was as impure as that employed ten or twelve years ago. But a great improvement has been made, not alone as regards the purity of the ingredients composing amalgam, but also as to the manner of preparing and introducing it into the teeth.

The following is the best method for using this material in cases where its use is indicated:

"Mix and incorporate the Fillings with *Redistilled Mercury*, in the usual way, to the consistency of a stiff paste. Wash thoroughly with Alcohol, adding a few drops of a strong solution of Chloride of Zinc, and remove any excess of Mercury by twisting in a piece of chamois skin or stout muslin, then with a pair of large Flat-nose Plyers, press the mass until about the thickness of an ordinary knife-blade, and cut into squares or blocks suited to the size of the cavity to be filled. Should the Amalgam be too dry to work satisfactorily, warm the instrument used slightly over a spirit-flame, and apply steadily to the mass in the cavity for a few moments, and the desired object will be attained."

"The squares or blocks can be best conveyed to the cavity with a rough surface instrument, but should be worked with a smooth surface plugger, slightly heated by passing through a spirit-flame, or dropping in hot water."

"It is a great mistake to suppose, as many do, that it makes but little difference what kind of an instrument is used in plugging with Amalgam. It is just as necessary to have instruments especially adapted to this work as it is for any other description of filling Next to the use of Amalgam of inferior quality, there is doubtless nothing that has caused so much dissatisfaction in its use as the want of suitable instruments."

"The same care should be given to the preparation of a cavity for an Amalgam filling as for Gold. The edges should be nicely beveled, the cavity thoroughly dried, and slightly touched with Creasote. In the event of a near approach to the pulp, it is best

to guard against after trouble by placing a small quantity of Asbestos enveloped in Tin-foil to cover the base of the cavity."

"It is important to keep the cavity dry, if possible, during the operation. The Amalgam should be condensed firmly from base to surfacè."

"When the filling is sufficiently hard, finish and burnish as carefully as the best quality of Gold filling."

Teething Syrups and Powders.—A correspondent of the *California Medical Gazettee* writes that he was called to an infant of six months old, who was in a dying condition, apparently from the effects of a narcotic poison. It had taken no medicine except " Mrs. Winslow's Soothing Syrup," of which it had taken within ten hours, two doses of about one teaspoonful each. A skillful chemist analysed the syrup remaining in the bottle, about 10 drachms, and it yielded of morphine and other opium alkaloids 1 14-100 grains, very nearly one grain to the ounce of syrup. Following the directions upon the label there is a dose of morphine equal to 10 drops of laudanum, given to a child of three months old every two hours, and double the quantity to a child of six months old. As four drops of laudanum have been known to kill an infant of nine months, this writer thinks that the analysis of this syrup should be published, that the profession, and through it the public may be warned of the fearful effects of administering this dangerous and popular nostrum.

In the *London Med. Times and Gazette* appears an analysis of "Stedman's Teething powder," an English nostrum, as follows : Calomel, 42.03 ; Organic Matter, 57.97 ; Ash, trace ; in all 100.00 The organic matter appeared to be quite inert. It was soluble in water, giving a solution having no particular taste. No opium was detected. There was no corrosive sublimate. These powders vary in weight from 1.42 grain up to 2.78 grain, and each one contains from about 6-10 grain up to 1 1-10 grain of Calomel mixed with rather more than its own weight of some diluent substance.

The Thirtieth Annual Commencement of the Baltimore College of Dental Surgery, will be held at the "Concordia Building," Baltimore, on Wednesday evening, March, 2nd, 1870. The Alumni and friends of the institution are cordially invited to be present.

Pathological Specimens of Teeth.—We are indebted to Dr. Jno. C. Story, of Emory, Virginia, for several interesting specimens for the Museum of the Baltimore College of Dental Surgery. The friends of the College can greatly aid the cause of education by contributions of this character, for which due credit will be given, and the name of the donor attached to the contribution.

The New York College of Dentistry.—We are gratified to learn that this institution is again in operation. The names of but two of the original members appear among the present Faculty, Drs. Abbot and Weisse. Among the new members are two of the graduates of the "Baltimore College of Dental Surgery," Dr. C. A. Woodward, Professor of Mechanical Dentistry, and Dr. James B. Littig, Demonstrator of Mechanical Dentistry. The new Faculty have our best wishes for a long and successful career.

Prang's Chromos.—Good taste displayed in rendering Dental Rooms attractive and comfortable, is certain to be appreciated by all intelligent patients. All practitioners of Dentistry should be aware of this fact, and as paintings and engravings contribute greatly in improving the appearance of the office and reception rooms, they should be regarded as part of the necessary furniture.

We have before us one of Prang's American Chromos, entitled "Family Scene in Pompeii," from the painting of Joseph Coomans a Belgian artist of renown, who has devoted himself almost entirely to the delineation of the family life of Greek and Roman antiquity. The delicacy of finish and the brilliancy of coloring which this chromo-lithograph presents, shows it to be an admirable specimen of art.

The difference in price between these chromos and oil paintings of any merit, enables all to adorn their apartments at a comparatively small cost, with what are as attractive and beautiful as other more costly works of art.

"Corregio's Magdalena," "Sunset on the Coast," "Sunlight in Winter," "Esophus Creek," and "White Mountains" are other beautiful chromos among the collection published in Boston by L. Prang & Co.

Spectral Analysis.—This subject was most ably and scientifically handled by *Prof. E. Lloyd Howard*, in a lecture before the *Peabody Institute*, of Baltimore, delivered January 27th. As this method of philosophical investigation is attracting deserved attention, we will endeavor in a future article, to give an abstract of the more important features of the lecture.

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ARTICLE I.

Vulcanite.

By Professor Austen.

Within the last decade, dentistry has suffered its severest loss, through its greatest gain. Invention has given to the dentist no material more useful that vulcanite; none, the use of which has proved more injurious. This seeming contradiction, this *Dental Paradox*, is only one of the oft recurring instances of man's perverted ingenuity in converting benefits into injuries; proving, if proof were needed, the law of the moral world, that the worst of all curses is a blessing abused. We say "moral world," for whilst the utility of vulcanite is physical, the evil effects of its misuse are moral. The material is no more censurable for the harm done, than the dagger of the assassin is guilty of murder. Yet it is wise to take dangerous tools out of the reach of the unprincipled; wiser still, to place the actors themselves, where they can do no mischief; wisest of all, to instill such sense of moral obligation as makes restraint unnecessary.

The remarkable properties of "Hard Rubber," attracted the attention of certain dentists, more than fifteen years ago.

The very cumbrous apparatus, and the very tedious processes then thought necessary, interfered with a recognition of its merits. The few, who did recognize them, persevered in its use; inventive genius simplified the details of the work, and results are now obtained, within reasonable time, by compact apparatus. The almost universal use of the vulcanite to day is a tribute to the sagacity of those, who, in 1858-60, withstood the storm of obloquy and abuse that assailed those who ventured to suggest that a material could, in any respect, be equal, or superior, to gold.

"Familiarity breeds contempt," is a social proverb, but it applies, with even more force, to the habitual non-appreciation of the qualities of things which we are daily using. The writer can never forget his first incredulity, when shown a hard rubber comb—his astonishment, when convinced that it was only another form of that pliant plastic thing, known as rubber. Many readers will recall similar emotions. The same property of vulcanite exists to day; nor is it the less wonderful, because its availability has been simplified, difficulties removed and anticipated objections found to have no foundation in fact.

"A substance so plastic that it can be readily moulded to the most complex shape; copying the minutest detail and retaining its form, whilst passing into the condition of a hard, strong, elastic, light and unchanging material."

This is the invaluable gift of some inventor (Goodyear, or whoever else he may be) to dentistry. Did he cast his pearl before swine and have they turned again to rend him? So the patentees seem to think and are laboring hard to "ring the nose" of the profession. As this is one ground of the present disfavor of vulcanite, let us give it a little attention.

When the member of a profession patents any invention or discovery, yet prides himself upon the *liberality* of his calling, he is open to the charge of inconsistency. We leave him to "fight it out on that line," and cannot here discuss the point. His right to reap the reward of toil is indisputable; whether he shall take pay in honor or in hard cash, is

a matter of taste; he can seldom get both. But a patent once secured, its validity sustained—it is as much entitled to respect as any other species of property.

The sale of a patent-right involves mutual obligation. One party pays for the privilege of using; the other guarantees to protect against the competition of those, who attempt to use without purchase. The rubber patent is enforced by parties, who fail to make good this guarantee of protection. Hence many honorable dentists refuse further compliance with a compact which has been violated. Mutual recriminations, law suits, actual and threatened and a host of vexations arise. Patentees think dentists generally a pack of thieves and are in turn charged with being a set of swindlers.

Now, in fact, under both charges, lies some show of truth. Thieves abound everywhere. Some steal bread, some money, some brains—or rather brain work. Theft of money is an unpardonable sin; it is the world's idol and must be duly respected; necessity may pardon the theft of bread; but the theft of brains—identify your property and recover as best you can! Meanwhile the thief profits by your work and does not suffer in reputation. All professions are infested with thieves of the third class, and dentistry is not exempt. They are hard to catch, harder to punish. For the satisfaction of defrauded inventors, we will suggest a way to detect and if they see fit, to expose such. When you see a dentist loud in his abuse of patents, vociferous in his praise of generous liberality, whilst having a little corner in his office, or drawer in his instrument case, which he is slow to exhibit to you—set him down as a "brain thief" of first water. He will steal an idea from you to day and sell it the next week, to his student or best friend, for fifty dollars.

But the existence of such, though a reproach to any calling, cannot disprove the fact that the majority of the dental profession are willing to pay any reasonable price for the use of a valuable patent, provided always the patentee sustains them against infringement.

As regards the rubber patent; for years no one knew whom to pay—even now, many do not know. Whilst hundreds use it with impunity, many will not touch it, although they have a high opinion of its value; because they will neither incur the charge of using what they have no right to; nor submit to the imposition of paying those who are not entitled to the money. This patent, so far as dentistry is concerned, has been outrageously mismanaged. It is mainly due to this, that the proprietors thereof find so much trouble in enforcing their "rights." Perhaps the most fatal errors are—first, the attempt made to compel dentists to violate professional confidence and furnish lists of their patients. Secondly, the clause in licenses which requires the owner to become a public informer. A national tax is a fruitful source of lies, and *royalty charges* occasion many false statements. We should be very glad to see the dental profession exempt from such corrupting temptation.

The remedy, in our judgement, for these vexatious ills, complained of alike by buyer and seller of the vulcanite patents, is to retain the privilege of manufacturing the material and selling it at a *very high price.* It would greatly benefit both patentee and dentist, if the rubber used in every piece cost not less than *five* dollars. The patentee can control the manufacture of rubber more easily than he can its use, and *cheap dentistry* would receive a dangerous wound—we had almost said death blow, but this dragon has more heads than that slain by England's champion saint. He has fattened and grown strong on vulcanite and his devastations are proportionately increased. We greatly fear that his St. George is not yet born.

And this brings us to the true explanation of the mischief wrought by vulcanite. Not because it has failed to sustain the promise of usefulness, it first gave. Its merits are such that, for certain important uses, its place cannot be supplied by any other known material. Not because of the annoyances of the Goodyear patent agents; although these are serious enough and have led to much demoralization. But

because dentist themselves have failed to recognize the true value of the material; because they have made an incidental quality its prominent advantage and their real motive for using it, namely its cheapness.

They have used it thus in that underbidding of rival practitioners, which is the burning disgrace of Dental practice. They have advertized their cheap wares to the world, till the community look upon "vulcanite" as a material which costs nothing, and think that the work spent on it has not much more value. Whereas, ten years ago, they could scarely overcome a patient's prejudice in favor of gold; now, they have so thoroughly demoralized the people, that they will not have gold when the necessity of the case requires it.

Were it merely a question of cheapnesss it would not be so serious; for it is a maxim of political economy, that he is a public benefactor, who reduces the cost of articles of necessity. But it is no benefaction, when the value is reduced in like proportion, and it becomes an imposture, when the value is still more reduced. Cheap dentistry is like "dollar stores" and "gift enterprises"—you may possibly get the value of your money—you most probably will not. Now and then, a dollar may buy ten dollars worth; but, in the long run, the inevitable laws of barter will prevail, and the dollar will buy only the dollar's worth.

There is no more certain law than that cheap work leads to bad work. If proof of this were needed in dentistry—look at the shapeless, inartistic, badly fitting lumps of rubber, stuck over with staring bits of porcelain, which issue from a thousand dental offices—*false teeth*, most appropriately so named—*false* to every idea of truth, beauty and fittness; made by men, *false* to all proper sense of professional pride and duty; worn by persons, *false* to their own self-respect and dignity, in permitting themselves to be thus disfigured and made ridiculous.

A dentist, who is mean enough to get work by underbiding, will be dishonest enough to make it correspond to

the price. And thus it has come to be a common, and alas! an accepted excuse for not doing what the case requires—"I cannot afford it at the price I get." Hence cheap dentistry is dishonest dentistry, when the price is such as to prohibit the fullest exercise of skill.

A dentist who works at prices, which demand unceasing toil to earn his daily bread, leaves himself no time for mental culture. His work becomes a drudgery, in no respect more elevating than that of a common day labourer. Hence cheap dentistry is degrading dentistry.

We sum up our charge against vulcanite—or more correctly its abuse—in that its cheapness and a certain facility of construction (in its crudest forms) have tended greatly to foster Cheap Dentistry and so to make dental art slovenly, dishonest and degrading. Whilst its peculiar properties are calculated in a high degree to develop art and skill, it has been so used as to lessen the demand for both, and to encourage a community to prefer economy to artistic workmanship. For this reason we regret that when, ten years ago, we predicted its universal adoption, based on consideration of its value, our prophetic vision did not forsee its sad misuse. Its abusers *then* were its opponents, maintaining their case by many absurd and false statements; its abusers *now* are its adherents—alas! that they ever ceased their opposition. Let us hope that, when the days of greenback currency are numbered, cheap vulcanite work will also breathe its last, and both mercantile and dental world have new life infused into them by a return to the old fashioned Gold Basis.

ARTICLE II.

Exposed Pulps and Fang Filling.

By Thos. J. Speck, D. D. S.

The writer of this paper proposes to review the various methods of treating exposed pulps with a view to the preservation of their vitality, together with the treatment of

fangs or roots of the teeth after the removal of the nerve, and the most approved method of "fang filling."

Some operators, whose position in the profession is such that their opinions and practice are at least entitled to attention, claim that after the pulp has become exposed, inflammation of the periosteum set up and even suppuration of a portion of the pulp commenced, that by excising the most diseased portion, and using certain therapeutical treatment, such as the application of astringents, escharotics and anodynes, followed by filling with some non-conducting material, that the diseased pulp can be restored to a healthy and normal state. The propriety of such practice is questionable. It is useless to speak of the highly sensitive and delicate nature of the dental pulp, this is presumed to be understood. The writer of this has attempted the practice in several most favorable cases, all of which resulted in complete failure. Others claim that by capping with gold, lead, tin, horn and oiled silk, that the vitality of the pulp may be preserved. At one time it was believed practicable, and many thought their operations a success; some patients complaining of slight dull pain—not of sufficient importance to apply for relief; others that no pain followed whatever. And what dental practitioner has not met with many cases of persons losing their entire complement of teeth, without suffering the slightest pain—known as sensitive or toothache? Probably the painless cases belong to such a diathesis. The sequel of all such operations proved entire failures, and the practice has been abandoned by most operators. On examination of the most favorable cases after one, two, or three years, the pulp was found entirely dead—some of the teeth producing so much pain and trouble, as to necessitate their removal; others remaining comparatively quiet, though dead.

In treating exposed pulps the only successful cases are those having no serious inflammation, and where this organ has been accidentally exposed by unskillful excavation; for there is no reason why the pulp of a tooth, in certain cases,

may not be restored to health as well as other parts of the system, having nutrition, circulation and absorption. Several such instances of filling with gold over a slightly exposed pulp, without inflammation or wounding the membrane, ten years ago, and the teeth still retaining their vitality and color, can be referred to in the practice of the writer. The practice of filling over diseased pulps, as claimed by some good operators, belongs to the past—has been found a waste of time, impracticable and uncertain. It is very nice to tell about, but to practice successfully is another thing. But some men, in fact all, have their "hobbies"—let them ride them in talk—but the conscientious dentist is always careful in making positive promises to his patients, that he knows to be doubtful even at best. Unfortunately for us as operators, our patients never apply for treatment of diseased pulps until all the parts are involved, so much so that restoration, if at all possible at a more favorable time, is highly improbable. What then, in justice to our patients is our duty? To give them advice and work that will prove truthful and beneficial, and will not bring self accusation on ourselves. Then we can maintain a position independent and secure the confidence and esteem all earnest laborers deserve. There is a mode by which such teeth can be preserved almost painlessly, and in many cases be made as useful as ever, and in appearance and service equal to living teeth. This plan is the extirpation of the pulp—reducing the parts to a healthy condition, and thoroughly filling both nerve canal and pulp cavity. The various methods of securing this result, depends to a considerable extent upon the condition of the mouth and tooth and the age of the patient. For a successful operation it is necessary to restore the adjacent parts to a normal state, as well as the tooth. In recently exposed pulps the best practice, according to the writer's experience, is to extirpate the pulp by the surgical or "Heroic" operation. Armed with a well tempered barbed broach—and much depends on a good instrument—we extract the pulp directly, using some one of the various

anæsthetic agents—the ether spray being preferred; and in cases of good strong constitution, as soon as the hæmorrhage ceases the tooth may be filled. Great care should be taken to remove all debris, which is often very difficult. Failures result sometimes on account of slovenly practice in this respect. Small particles of dentine—almost an impalpable powder—may be forced through the orifice of the canal of the fang, and being foreign, is a source of irritation. Now, the cavity and nerve canal being prepared, and the tooth ready for the filling, what shall we use? There are various materials and each has its warm advocates. It is potent to all that the material which can be used with greatest facility and condensed most thoroughly is best. Some advocate shaping a piece of seasoned hickory wood, and before inserting saturate with creasote. The question arises, Will not wood, as it is very porous, absorb the fluids and gases thrown off by the excised portion of the nerve and inflamed periosteum and thus produce disease? And the wood is liable to be forced through the canal at the apex of the fang, and produce irritation. Others advocate filling a portion of the fang with cotton saturated with carbolic acid or creasote. Others again, to fill the fang entire with os artificial, or some of the various plastic fillings, which practice is of doubtful propriety. In fact it seems almost impossible to thoroughly fill so long and narrow a cavity with such material, and half filled is as poor as no filling at all. How can such material be carried through the windings of some nerve canals, and how can we be satisfied the filling is thorough and entire? The nature of the material is such that the orifice would become choked, and the operator be deceived as to the completeness of the filling. The opinion and experience of the writer is that the best material is No 2 or 4 plain gold foil. The best manner to introduce the first gold is to roll a few folds of foil around a very fine smooth broach and carefully carry as far up the canal as possible, and then thoroughly consolidate. By exercising care in forming the roll there is no

danger of forcing the gold through the foramen at the apex of the fang. The next gold may be introduced in the same way, or in ribbons or ropes as the operator prefers or finds most convenient, so that every portion of the canal is firmly and densely filled. Then proceed to fill the crown as in other cavities.

When the direct extirpation of the living pulp is impracticable, it must be devitalized before extraction. The devitalizing agent generally employed at the present day is arsenious acid, and this is considered the most certain and least injurious to the tooth structure. Still all must admit that an agent so powerful, and that acts so rapidly and surely on the nerve substance, leaves some of its destructive properties in the surrounding parts. A general discussion of its influences will not now. be made Its action is strange and unaccountable. In some instances it may be applied to an exposed pulp in an inflamed condition, the tooth giving the most excruciating and acute pain, and the application render immediate relief. At other times in the same mouth and under the same pathological conditions, it will increase the pain. Some writers contend that when it is applied to an exposed and lacerated pulp, pain will follow; while others assert as confidently, that when applied to a pulp with a slight wall of dead dentine intervening, that pain will ensue; all of which in the practice of the writer has been found true, consequently no positive theory has as yet been established. Its freaks are peculiar and no hypothesis has yet been advanced to account for the various effects. It cannot be said—with due respect to the opinion of others—that the various effects depend on the peculiar diathesis or characteristics of the patient, for this assertion is made from actual experiment; that arsenious acid has been applied in two teeth pathologically the same in every respect—even adjoining teeth, and different results followed. However, with all its shines, it is a kindly agent, both to operator and patient, in a great many instances. There are many difficult and almost inaccessible pulp cavities which we are called upon

to treat, and without the aid of some ready and certain devitalizing agent our efforts would be vain. Such as highly sensitive and nervous temperaments—teeth with tortuous nerve canals, and when the operation of extracting the pulp would require time and care, it is essential. The manner of application is known to all, and to repeat it here is unnecessary. Nevertheless, great care and caution should be exercised in its use. In most cases one application, properly applied is sufficient, and the length of time to remain in the tooth is from 12 to 24 hours. It is well then to remove all extraneous or loose matter and carefully syringe with tepid water, and then seal the cavity with cotton and sandarach varnish, and after the lapse of four or five days the pulp may be removed comparatively without pain. The next step then is to carefully prepare and shape the crown and pulp cavity and dress with creasote or carbolic acid, and dismiss the patient for another day. If no inflammation or signs of periostitis supervene the tooth may be filled with impunity, but should suppuration or discharge of fetid matter occur, which can readily be ascertained by introducing floss silk or wisps of cotton, the tooth should be dressed daily with iodine, creasote or carbolic acid, until all discharge ceases. Some operators prefer to insert a test filling of silk, to remain for a few days, which may be a good precautionary measure, but in many cases we cannot demand so much time of our patients, and when a practitioner educates his eye to minutely diagnose the parts around a tooth as described, he will not have many failures. Should abscess follow, the writer has found it best, if he has access to the case before an opening has been made for the discharge of pus through the alveolar ridge, to treat externally—that is if the filling is a good one let it remain—with a small, slightly curved hatchet shaped excavator, cut freely down through the alveolus to the apex of the fang, and tear up the forming sac, and insert a seaton thoroughly saturated with iodine and chloroform, creasote or carbolic acid, and dress once or twice a day as convenient. When properly conducted and under

ordinary circumstances, a permanent cure may be expected.

There is another class of pulp cavities, the treatment of which give us more trouble and reqnire a greater amount of skill and patience than the foregoing, which are teeth whose pulps are already dead. Great care should be taken in preparing the entire mouth, by removing all pre-existing causes of irritation, and as much as possible get the mouth in a healthy condition, before any action has been taken with the tooth. First, I remove all loose dead matter, and dress with agents well known to all operators, before excavating or shaping the cavity. Such cases require more energetic therapeutical treatment than any class of diseased teeth. After all evidence of inflammation has disappeared, and all acrid or offensive matter has been removed, the cavity may be prepared by gentle excavation, and letting it rest a few days, using at the same time the dressings named in the preceeding cases. Now if a test filling is of any advantage it is best employed in cases of this character. The fang should be filled with floss silk, and the crown with some solid temporary filling. After a reasonable time— say from three to ten days, and the tooth remains perfectly quiet, a permanent filling may be inserted as in the other classes, and in a majority of cases with entire success. If the profession would exercise more patience and skill, and teach their patients the great value of even dead teeth correctly treated, many valuable organs that are daily sacrificed might be preserved, and at the same time build lasting monuments to our skill and progressive science.

ARTICLE III.

Germinal Matter.

By Thruston Wolfe, D.D.S.

Life may be considered as the production of a physiological condition of an organization. It may be divided into two essential states or conditions. First, the material condition, and second, the dynamical. The material condition

consists of food, oxygen and water, each being directly essential to the maintenance of a normal action of the organs of the body. The dynamical condition consists of light, heat and electricity. They also bear an important relation in the great laboratory of life. These two conditions work in such harmony as to bring to bear such results as achieve the hystogenetic and histolytic processes.

In the consumation of these results there are found to be two distinct forces at work, viz: First, vegetative force and second, animal force. The first has the power of assimilation, propagation and development .The second power exhibits the development of muscular, nerve and brain forces. There must be a basis upon which these forces may act, this we call "Germinal Matter." This being the case, we naturally enquire what this germinal matter is? The answer is, it is the great constructive basis substance of organic life. It is that from which all the tissues are formed.

In the fœtus there are noticed at first a number of cells which have the power of assimilation and propagation. These cells multiply very rapidly in a mass and after a while they begin to form themselves with a certain definite outline showing somewhat the shape of the body to be formed. These cells develope into tissue in a manner hereafter to be described. Germinal matter asserts its power in both vegetable and animal kingdoms, but is decidedly more persistent in the vegetable than the animal kingdom. To prove this we will cite a case of some wheat which was found in a pyramid supposed to have been there at least two thousand years, and after being procured and planted was found to germinate, grow and bring forth species after its kind. So also even some raspberry seeds found in the stomach of a man who had been petrified, who had on his person some coins of the date and reign of Emperor Hadrian. No definite idea of the length of time that elapsed from the time of eating till they were found. But certainly a great many years. These seeds on being experimented with were found to germinate, grow and bear fruit of the same species. These

and other instances show that notwithstanding the long periods that elapsed between the time of their first growth and perfection to that of the second, the germinal matter of these seeds did not lose its power of assimilation, propagation and development.

But germinal matter acts in a different manner in the animal kingdom. It is found in a clear, limpid fluid called pabulum and has a nucleus around which it forms, grows and multiplies, each little mass dividing and budding forming more masses as large as was the parent mass. It is manufactured of this pabulum in which it is found, and is rarely more than .0001 of an inch in diameter, each little mass having an approximate size. Should it grow larger than its normal size, it could not act in a histogenetic manner. For the nutriment it supplies cannot be derived from the centre of the mass, it being to thick and large for the proper current to enter and carry the nourishment to the parts required. Therefore it must lie useless and its first is always in a retrograding manner. It has been remarked that germinal matter has three stages of existence, viz: First, assimilation, second, propagation, and third, development.

Assimilation is that process by which the germinal matter forms to itself the material in which it is placed, making itself instead of leaving it pabulum.

Propagation is that process in which the germinal matter multiplies itself and instead of remaining one mass, becomes many. This process is done by dividing and budding. The budding is distinguished from the other process by a small speck seen on the side of the mass, and growing forms a mass as large as the parent and is nipped off. The other process is the little masses simply dividing and becoming other masses. The developmental power is distinguished from the other two in that the germinal matter has run its course and accomplished its aim and has formed tissues, organs. The exhibition of these three powers is entirely requisite for the formation of healthy tissues. These powers

are respectively denominated the first, second and third powers.

They do not always exhibit their inherent right in their attempt at development. For when there is an abnormal arrangement in the germinal matter at work, the developmental process is retarded and often completely arrested. The failure of the exhibition of either the first or second powers, always arrests the third. After it has exhibited the third or developmental power, it is formed material; this formed material being the result of a normal action of the vegetative forces. There is a test showing a distinctive feature between germinal matter and formed material. This test Beale calls the "carmine test," it is composed of ammonia, carmine and glycerine.

When an application of this carmine test is made to germinal matter, it turns it red, whereas it does not change the formed material at all. "On close examination the muscular fibres are found to consist of minute particles strung together like beads," and between these are found the nutrient masses which supply the tissues as fast as they are wasted during the continual changes that are going on during life.

Special tissues are formed by a special power inherent in the germinal matter of those tissues. Germinal matter is found wherever tissues as to be formed. The three vegetative powers are very highly demonstrated in the formation of epidermic scales and epitheloid cells. The epidermic scales are found on the skin and the epitheloid cells in the mucous membrane. The scales are formed from the germinal matter which being first in the mucus immediately external to the aveola tissue and exhibiting the three powers, finally terminating upon the periphery and by lateral pressure become flattened branny scales. The epithelial cells are also formed from the mucus globules as first noticed in the pabulum and displaying the three vegetative forces.

The function of the skin is for the external covering and protection of the body and osmotic action. That of the

mucus membrane is for the internal lining of the body and osmotic action.

Germinal matter asserts its inherent right when in a normal condition under all circumstances. For instance, in the process of grafting and budding, the grafts or buds grow and bear fruit or flowers after its original kind. So also if the germinal of the periosteum of bone be removed to another part of the body and planted in the soft tissues it will give birth to a bony formation and not the kind in which it is planted. In the formation of bone we notice at first a cartilaginous mass composed of cells placed promiscously in it. This stage is called the simple cellular, afterwards, however, these cells begin to arrange themselves in lines which are to become in the bone the Haversian canals and the medullary channel. These Havesian canals run into each other, and divide sometime, and give an irregular power condition to the bone. Radiating from the Haversian canals are a number of small tubes called canaliculi. A great number of laminæ are found around the Haversian canals and are very thin layers in close proximity with each other. These laminæ enter largely into the formation of the bone.

Along the line of these canaliculi are seen little cavities which have leading from them other canaliculi, which also run into other little spaces and then into the Havernian canals again. These little spaces or cavities are termed Lacuna spaces and contain lacuna masses which is the germinal matter of bone. The canaliculi are the plasmatic tubes. The medullary canal is formed by the absorption of the parts along the row or line of cells which were formed in that portion of the bone which is to contain it Ossification of these canal and cell walls gives the bony substances. Bone it composed of organic or animal matter, and inorganic or earthy matter. The organic composes about one-third o the bone; it is gelatine and bloodvessels. The earthy matter constitutes two-thirds; it is composed of carbonate and phosphate of lime, fluoride of calcium, phosphate of magnesia, soda and chloride of sodium. This bony substance

forms the greater part of the hard tissues of the body and gives a framework for the attachment of the soft tissues of the body and protection to more vital parts, such as the brain, spinal cord, heart etc. It is termed the skeleton. There are 204 bones in the body and are called long, flat and irregular. They grow in circumference from the germinal matter supplied by the periosteum on its external surface, and from nutrition supplied by the medullary. They grow in length by another process. Near either extremity in the young bone is found a division of the parts and connected by a layer of cartilage. From this cartilage is supplied an amount of germinal matter which forms new bone, and as the cartilage next the free surface of the bone becomes ossified new is formed. Thus the process of ossification and reproduction is going on regularly till the bones have reached their maximum length, at which period the whole of the said cartilage becomes ossified; when this occurs the bone can never grow longer.

The teeth are formed in somewhat a different manner, at about the sixth week of intra uterine life there are noticed two folds of mucous membrane in the place where the upper or lower jaw bones are to be formed. The outer of these folds is for the cheek and the inner for the tongue. About the same week a ridge begins between these folds running from behind forward to meet in the median line. This ridge divides the groove into two grooves. About the seventh week after conception is seen the germ of first temporary molar in the primitive dental groove of the upper jaw, in the form of a "simple free granular papilla," of an ovoidal shape.

One after another of these papillæ are formed in the primitive dental groove, and at the same time processes are sent out from the outer and inner walls of the groove, forming follicles for the papillæ. This is denominated the follicular stage. The mouth of the follicles become more developed and grow up and close in the papillæ. The lids covering these papillæ are termed opercula. This is called

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take place. The cementum or crusta petrosa is formed by the germinal matter given by the dental sac in that portion of the tooth. Its structure is analagous to bone. It occupies that portion of the tooth which is external to the dentine, below the neck of the tooth, and is less liable to disease than any other portion of the tooth; and the disease is generally different.

Germinal matter does not always exhibit a healthy action. Very frequently it displays abnormal conditions which are irreparable within itself.

"The law of low vitality is arrest of development." Thus when germinal matter makes an abortive attempt at development, we know at once that its vitality is lowered. In the formation of pus, there is an arrest of the third or developmental power, an inordinate exhibition of the first and second, or the powers of assimilation and propagation. The vitality of the masses of germinal matter is lost in proportion as the work of propagation progresses. For when the vitality is gone, we notice a greasy, creamy, thick and yellowish mass which has become entirely passive in its action. Pus reaches the free surface by three methods: First by passing directly through the epithelial cells by osmodic action and appearing on the surface. Second, by softening the cells and causing them to give away and appearing on the surface. Third, by bursting the tissues by tension and coming through by force and appearing on the periphery. Mucus, mucine, fibrine and the amyloid change are all exhibitions of the developmental power partially arrested. The hard tissues are also liable to disease and undergo a hystoitic process as well as the soft tissues. In caries and necrosis of bone, for instance there is a decided and complete arrest of the three powers of histogenesis. Caries of bone is that condition in which is found the animal matter in an abnormal condition, the lacuna masses not performing healthy functions and a suppurative process takes place; caries is the first step to necrosis. In it is found the first and second

powers exhibited and an abeyance of the third. It ulcerates and discharges a fetid matter like the soft tissues.

Necrosis is complete and absolute death of bone. That portion of the bone has lost all its vitality. The germinal matter having lost the force of all its powers.

The teeth are also attacked by caries, but there is a marked difference between the caries of teeth and bone. In teeth it consists of a decomposition of the inorganic basis and the disorganization of the animal framework, and never throw out fungus granulations as bone does. Caries may be classed into three varieties, viz: Chemical, Vital and Chemico Vital.

The chemical cause of caries is the direct action upon the teeth by such agents as destroy its organization. The vital is the death of the animal framework of the organ and then acted upon by corrosive agents.

The chemico vital is the chemical action first and after the death of the animal matter of the tooth.

The causes of caries are various. Acids of the mouth, the use of strong medicines and salivary calculus upon them, the condition or state of the health, irregularity, and in fact everything that does not accord with the normal condition of them will produce it. They will never undergo a reparative process as bone does. Nature can never bring about a histogenesis.

ARTICLE IV.

The Hygrometer,

Or measurer of moisture, has hitherto attracted little or no popular attention, while as an instrument for hygienic objects, it has no equal in importance Doubtless the difficulty of constructing one, simple in its parts and accurate in registration, has prevented a popular and general knowledge of its usefulness, and lost to the people an unerring guide to the relations of heat, ventilation, and evaporation, and their combined effect upon health. A few words will recall to

the recollection of such as are informed on the subject, the operation of the laws that control this instrument; which, though as simple as they are beautiful in themselves, seem to reach results by a complex process—but it is only seemingly complex—unless by dry calculation—as the hygrometer proves.

The principle of operation of the motor substance of a self registering instrument, is that it absorbs moisture from the surrounding air in which it is placed, until they—the substance and the air, become equally saturated and they so remain under all circumstances of change; the motor expanding with the absorption and contracting with the loss of vapor, incident to the amount of heat held from time to time. This expanding motion is communicated in some proper manner to the index, and the eye is instructed at a glance of the hygrometric condition. Now, when it is considered that the atmosphere holds vapor in quantity precisely proportioned to existing heat, but out of proportion in every *change* of temperature, it will be seen why the term " seemingly complex " has been used.

As a starting point assume a temperature of 32° Fah., thermometer; at this; as at all others within the range under consideration, any excess of vapor will be deposited upon a proper surface, as dew; and for another 3½ degrees, more or less added to this heat, another volume of vapor will be absorbed and firmly held by the air, so that at 35° to 36° there will be double the moisture held, latent—if the word may be used—that could be so held at 32°, and for three or four degrees of increased heat another volume is taken up, until at 100° of the thermometer there will be found about 25 times more water contained in the air as vapor than there was at zero. This is the law which controls the condition of things on the observance of which health and frequently life depends, and to which some unerring guide should unceasingly call attention.

In extremely dry atmosphere the tissues of the body, as indeed of all organic substances, are severely taxed in yield-

ing to the despotic demand for moisture, but the principal danger to health is in the changes which occur during the reduction of the temperature of air highly charged with vapor. The law above hinted at operates inversely here, in that for three or four degrees of heat removed, what was called a volume of moisture at 32° is set free, and so for every additional reduction an additional volume is thrown in a chilled state upon all objects with which it comes in contact.

The importance of recognizing this truth for warm climates or high temperatures, will be conceded, when it is considered that four fifths of the vapor of water held at 100° is discharged before the mercury falls to 50°, rendering it to the animal body a danger of no mean significance and one which the senses do not always promptly recognize without artificial assistance.

The popular need for some simple and cheap instrument for ascertaining the quantity of moisture in the air, seems likely to be met by an ingenious apparatus before us, invented by Mr. R. H. Atwell, of our city, now being patented. It is useful for showing the condition of the air in sitting rooms, chambers or elsewhere, and will be fully understood from the following illustration and description.

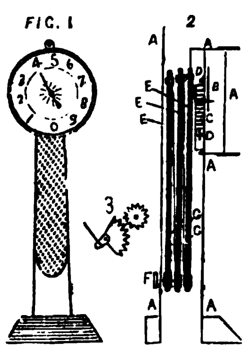

Figure 2.

A. Frame work surrounding the hygrometric substance, including index in front.
B. Pointer on index face.
C. Segment, toothed to engage pinion on pointer.
D. Connecting rod from hygrometric strips to segment.
E. Strips of hygrometric expanding substance.
F. Screw holding the first strip to the frame.
G. Metallic rods holding firmly the top end of one strip to the lower end of the next, made mostly of iron and compensating any expansion by heat.

Figure 3

is the toothed segment, with a portion of the connecting rod in one direction, engaging the pinion in the other.

The mode of operation of this instrument is thus:

The strips E, which are generally of wood cut across the grain are inserted at their edges in shallow polished metalic grooves, and as moisture is absorbed by them, the movement commences at F. The first strip E, by its expansion imparts motion through

rod G. to the next strip, which in turn sends forward the aggregate of its own and the movement behind it, and so on until at the rod D, connecting the last strip with the oscillating segment, (Fig. 3) a circular motion is communicated to the pointer B, of the index. This index instructs the eye by the engraved words "HEALTH," "DRY," "HUMID" or "DEW," as the case may be, and the numerals surrounding the face mark 100 degrees.

SELECTED ARTICLES.

ARTICLE V.

Heavy Foil.

The latest novelty, in dental science, attracting much notice, is the use of heavy foil. Foils ranging from 20 to 120 grains to the sheet. The credit of introducing this new sensation, is due, so far as we have been able to learn, to Dr. W. H. Atkinson, of New York. It was brought to our notice by Dr. H. S. McKellops of this city. Dr. McK., while on a visit to New York the past summer, called upon Dr. A. who, with his usual urbanity and politeness, invited his friend to witness the operation of filling teeth with the heavy foils, Nos. 15, 20, 30. Dr. McK. reports himself as very much surprised at the apparent ease with which the Dr. manipulated them in all classes of cavities, and at the fine results produced. So well pleased was he with what he saw, that immediately on his return home, he commenced the use of heavy foil in his own practice. The attention of ourself, and other members of the profession, in the city, was called to it by Dr. Mc., who invited us to witness the operation of filling with the heavy Nos., 20, 30, 60. The result has been the general—I might say the exclusive adoption of them by all who have given them a fair trial. Prof. Judd is using No. 120, in some special cases, and speaks of it in the highest terms, but thinks Nos. 20 and 30 will be most generally used; uses 120 on large flat surfaces.

Having adopted the use of them ourself, to the exclusion of all the lower Nos., and being daily better pleased with the results, and most fully satisfied that it is the best form

of gold for filling extant, we ask the attention of our readers to a few facts respecting heavy foils:

Whew! says one, what a piece of nonsense. You are certainly not going to ask the profession to adopt this new folly because Drs. A. and B. see fit to recommend it. Why, the ink is hardly dry on your letter recommending the extreme low Nos., 2 and 3, for the same advantages now claimed for Nos. 20, 30, 60. What inconsistency! Do you suppose the profession will accept and adopt, as new and practical, a form of gold, which was tried long years ago, by one of the best operators in the profession, Dr. Arthur, and given up as impracticable. Because *some men* stir the broth must we drink it? Now, dear reader, what matters it who does the stirring if the broth be drinkable? If we are not able to do the stirring, don't let us deny others the privilege, or refuse to drink because we had no hand in the making. Having tasted this last bowl of broth, we are prepared to recommend it; we know its components and the principle upon which it is concocted; we know it to be savory, and believe it to be a promoter of health. We are willing to acknowledge it does look a little inconsistent, after what has been said in favor of No. 2. Still we think, a pretty strong case can be made for No. 60. I am also aware that Dr. Arthur tried heavy foil, but I am not disposed to allow that the foil he used possessed the same qualities as that we now have. Neither was his mode of manipulation the same as we now propose.

We adopted the use of No. 2, and recommended it for its apparent softness, adhesiveness, and for the ease with which it was manipulated; we say apparent, because we now believe it does not possess in fact, these properties in excess, only in appearance. Being so extremely thin it offered but little resistance to the instrument, and the particles were so easily driven together, and so firmly held by the mechanical process of interlocking that we were led to believe it possessed all the requisites of a perfect filling. If we but study the properties of this metal, gold, and note some of the laws

governing it, we may be able to account for some of the advantages claimed for No 60. Pure gold is a soft malleable ductile, tenacious metal, crystalline or cellular in structure; specific gravity 19.2, which may be increased to 10.6+ by lamination. It possesses the pecular property of adhesiveness, or cold welding. By lamination the malleability, ductility and tenacity, as well as density is increased to a limited degree, while it is rendered less soft, and the cold welding property is perceptibly diminished.

A trace of iron, copper, or silver, as an alloy, makes it harder, and perceptibly lessens its adhesive property, while the other properties mentioned are increased. The molecular condition of the surfaces as well as of the mass affect the adhesiveness. Foil when taken from the cutch is hard, elastic and non-adhesive. Change its molecular condition by annealing, and it becomes non-elastic and adhesive, dependent upon the degree of heat to which it is subjected. Foil subjected to the action of certain gases, as sulphuretted hydrogen and phosphoric acid, at once loses its adhesive property, while ammoniacal gas works another change, rendering it more soft and velvety. We have at the present time several forms of this metal, in which it is used for the purposes of filling teeth, viz: sponge or crystal and fibrous gold, (all similar in character). Non-adhesive soft foils, ranging in Nos. from 4 to 10 grs. to the sheet, adhesive foils in Nos. from 2 to 6, and last, but not least, adhesive foils in Nos. from 20 to 120. If we compare these different forms with one which shall posses all the requisites of a perfect filling, being aided in our comparison by the known properties and laws governing the metal, we may place a very fair estimate on the comparative value of each. For instance, with the present mode of manipulating a filling by mallet pressure, the gold should be soft, tenacious, adhesive; readily adapted to the walls of the cavity, and capable of being rendered uniformly solid, without the expenditure of too much time or labor. If we compare sponge or crystal gold by this standard, we find it soft as desirable, but wanting in tenacity,

It is readily adapted to the walls of the cavity, but it requires too much time and labor to thoroughly condense it and to secure perfect margins. Non-adhesive foil is sufficiently soft and tenacious, and is quite readily adapted to the walls, but lacking the adhesive property it is not so well adapted to the present mode of manipulation, and to all classes of cases, as sponge or crystal gold. Adhesive foils, Nos. 2 to 6, are harder than the sponge gold or the soft non-adhesive foils, harder also than the heavy Nos. of adhesive foil. The extreme attenuation of Nos. 2 and 3 makes them less tenacious and adhesive than the heavy Nos. Being hard and somewhat elastic, they are not so easily adapted to the walls as the non adhesive foils, and more time and care is required to properly condense them. Being exceedingly thin, and wanting in tenacity, they are easily broken and torn into small fragments or scales, which are not sufficiently adherent to stick to the face of a plug, and consequently break away in a short time, and are washed away by the fluids of the mouth; hence we find the surface of a large majority of the plugs made with these low Nos. presenting a rough unfinished appearance, full of minute pits from the serrations of the plugger.

Adhesive foil Nos. 20 to 60 and upward, approaches more nearly the sponge or crystal form in softness, because in the process of annealing it is brought back to nearly the same molecular condition. It also regains the property of adhesiveness to a much greater degree than the low Nos. Having been rendered fibrous by lamination it excels the sponge or crystal in tenactiy, and it is therefore superior to these forms in that respect. It does not break up or crumble under the instrument as these forms are apt to do, If properly manipulated it is readily adapted to the walls of the cavity, and with the same expenditure of time and care it may be more thoroughly condensed, and better margins can be secured than with any other form; being soft, non-elastic, tenacious, and adhesive, it may be carried over the edge of a frail wall without crumbling the wall in the least, its thick-

ness preventing injury to the border or wall of the cavity by the sharp points of the plugger being driven through it, a difficulty attending the use of crystal gold, and the extreme low numbers of foil. Its extreme adhesiveness admits of the use of very fine serrations on the point of the plugger, hence the surface of the plug presents a more solid and uniform appearance: being very tenacious it makes a more lasting surface, because the foil is not broken or torn by the instrument in condensing, as has been observed is the case with the low Nos. and with crystal and sponge gold.

We have thus briefly endeavored to give our readers some of the principal reasons for our adopting this new hobby of Dr, A's., and we feel assured of receiving their thanks for thus calling attention to it, if they will but give it a fair trial. Our mode of manipulating the heavy foil may be the subject of another article.—*Missouri Dental Journal.*

ARTICLE VI.

Adhesive Gold Foil—Its Discovery, History, and Use.

By A. WESTCOTT, M.D.,D.D.S., Syracuse N. Y.

Formerly Professor of Operative and Mechanical Dentistry in the Baltimore College of Dental Surgery, and late Professor in the New York College of Dental Surgery.

There is perhaps no one principle connected with dental operations of greater moment, or whose value is more universally acknowledged by the profession, than the *adhesiveness of gold*, either as foil, sponge, or however gold may be prepared, to make this principle available in filling teeth. Before this principle was discovered, the theory of making fillings permanent was, to a large extent, that they were kept in by leaving the orifice through which the gold is inserted smaller than the cavity within, and they were thus "dove-tailed" into the tooth. I have now in mind an advertisement issued *more than thirty years ago*, by a dentist who now stands at the very head of the profession, as an operator, which read substantially as follows: "I insert my

fillings in such a manner that they never come out, which I do by making the cavity *inside* much larger than the orifice through which the gold is inserted, thus giving it a firm mechanical holding." Now, this was a good, frank avowal of his way and manner of operating, and showed that he was then, what he has ever since proved himself to be, *an honest man.* This was, moreover, a *taking* advertisement; for in a very short time this young man was doing a fine business in a small country village, where, previously, dentistry had hardly been heard of and I have to confess that I looked upon this representation myself with no little admiration.

I have for a very long time been intending to prepare a paper upon *the origin and history of adhesive gold foil*, but have been waiting for the legion who have from time to time laid claim to originality in the discovery of this great dental fact,—that gold is susceptible of adhering to itself, or of being virtually welded at common temperatures,—to write out their respective claims, feeling that when all the rest were through, I would bring up the rear. How far or how perfectly I have thus been outflanked I shall let dates and facts speak for themselves.

In the spring of 1840, I was practicing dentistry in Homer, Cortland Co., N. Y., and ordered from T. B. Fitch, Esq., then a druggist at Syracuse. now an eminent banker of this city, and who well remembers the circumstance, an eighth ounce of gold foil by *mail.* It being in the days of high postage, and Mr. F. knowing that my extra pennies were few, undertook to do me the favor of economizing for me, by removing the intervening papers from between the leaves of foil. I received the foil in this way, and to my surprise, and I may well say, dismay, I was wholly unable to separate the leaves of foil from each other. They had, by some magic which had never before come to my notice, literally "grown together." What was to be done? I was not only *foiled* in regard to my promised operations, but I must await the going and coming of the slow coach, the long distance of

thirty miles, before I could take another step, and meanwhile writhe under the uncertainty of being able to better myself after all. More than this, I was in danger of suffering (for me) a heavy pecuniary loss, unless I could convince Mr. Fitch that the responsibility was upon his shoulders, in consequence of the blunder which he had committed, in the removal of the aforesaid papers. Here was presented to my mind the triple misfortune of the probable loss of my "job," the actual loss of two or three day's time, and the possible loss of a whole eighth ounce of gold foil!

This was surely a time for meditation and reflection, and I did reflect. This may possibly provoke a smile from some reader, but it must be from some one who did not begin the world as I began it. In all this there was to me "no levity." But in my sad ruminations I did not allow myself to forget the necessity of prompt action. I immediately wrote a sharp letter to Mr. Fitch, which was not mollified with a single expression of gratitude for his well-meant effort to do me a kindness, asking him immediately to replace the foil, by sending, "per first stage," another parcel, and with the strong injunction, to *leave the papers where he found them.* All this was as new to him as to me, and at once falling in with my suggestion, that "there must be something wrong about the *foil*," he immediately wrote to Mr. Barret, of Albany, who made the foil, for an explanation. As soon as the then slow mails could bring it he received a reply from Mr. B., which he lost no time in forwarding to me, apologizing to Mr. F. for having sent him such a batch of foil, and adding that, "once in awhile, foil would prove *sticky*, but he never sent out such foil when he knew it,"—all of which would have been very consoling to me had it accompanied the original package of foil sent me by Mr. Fitch.

But this information, "for immediate use," came too late. My reflections, ere it came, had taken another and very different channel. As soon as the shock was over, I began to inquire into the probable cause of this result, and as to

whether it did not present an idea which might be made available. The question soon arose,—*If gold foil might be thus virtually "welded" in a mail bag, why not in the cavity of a tooth?*

I lost no time in putting this question to a full practical test. I began my experiments by screwing together two plane surfaces of ivory, and drilling a hole at their joining. so that when taken apart one-half of the hole would be in each piece. I could in this way easily remove my filling packed into this cavity. This I did repeatedly, till, by hammering, and otherwise testing these filling, I became perfectly satisfied that I could make, of any number of pieces or pellets, *one solid, integral piece* that would take and retain a polish under any circumstances; and I can here truthfully add, that the first filling in the mouth which I did with this foil, was the first perfectly polished filling that I had ever seen. Thus was my vexation turned into a joy, "far more exceeding;" and before Mr. Barrett's letter reached me, which I think was in about ten days, I was ready to contract for all the "sticky" foil I could get; and the moment I got his letter, addressed to Fitch, I wrote him, (B.) asking him to save all of his "sticky" foil for me; and I continued to get such foil of him, from time to time, while he remained in business, or till Watts found a method of producing such foil with certainty and uniformity. After satisfying myself that the adhesiveness of foil could be relied upon, the next question which arose was, What were the conditions necessary to secure it? or, on what principle was it affected? I became satisfied that the cohesion or adhesion (for these terms, for all practical purposes, are synonymous) was something more than an interknitting of particles,—it was a surface joining, and was none other than that *cohesion* exhibited by two lead bullets when two fresh-cut surfaces were pressed together, the two becoming almost inseparable.

Looking upon the phenomenon as simply cohesion, I at once concluded that the rule laid down in all works on nat-

ural philosophy, in order to secure cohesive attraction, must be observed, viz: that "the particles, or bodies to be made coherent, must be brought in *actual contact.*" In other words, the foil must be positively free from *all* foreign substances. Any one will find, by trying the experiment, that in the case of the lead balls, above referred to, that if he simply draw a finger over the fresh-cut surfaces, it will effectually break up their otherwise strong tendency to cohere. Foil, then, even when of the "sticky" variety, must be kept perfectly free from *every* foreign substance, such as dust, soil, and especially from moisture. How frequently is the operator first notified of unseen moisture by the fact that his pellets won't adhere? And he might as well dip them into oil, as in water or saliva, if he wishes to avail himself of this quality of adhesiveness. From such facts and considerations comes the rule,—*Keep your foil positively dry during your entire operation.*

How operators have acquired prominence by submarine fillings, I have yet to learn. I have always supposed, however, that their pluggers were made of a goose-quill or other *pen*, and I fancy that such is not the kind of greatness to be marred by distance. To say the least, I do not believe that a *close* inspection of such fillings ever produced much "enchantment." Why adhesive foil loses this quality, simply by keeping, and why heating restores it, are questions which must have occurred to all. Is not the former question chiefly answered by supposing that it absorbs moisture, and the latter, that this humidity is dissipated by the heat?

But, to return more directly to the subject of this paper; I will say that from that day till the present time I have used adhesive foil in greater or less quantities, and with various modifications, till my present practice varies very materially from my early experience and practice with such foil. My discovery of, and experiments with, adhesive foil I immediately communicated to such dentists as I chanced to meet; for it will be understood that they were not as plenty in 1840 as in 1870, and the *adhesive principle* was as

little understood and practiced among themselves, as was this principle or its application to gold, in filling teeth. It will also be born in mind, that at that time there was but one dental journal published in the United States, and that but just started. I think that the first article of mine which was ever published in a dental journal (and this was not written for publication) was my essay on "Dental Caries," read before the American Society of Dental Surgeons, in July, 1843, and published the following September. It will be thus seen why I did not immediately *publish* the result of the *accident* above alluded to.

I very soon discovered that to work such gold foil to best advantage I must modify my instruments, and different experiments very soon (within a few weeks) brought me to the conclusion that serrated points were, better than any others, calculated to work it with ease and dispatch, and I accordingly altered all of my pluggers to conform to this idea. These were the first set of the kind which I had ever seen or heard of. Perhaps this paper may meet the eye of some one who can antedate me. This is certainly possible, and would in no wise detract from the originality of *my* discovery. Nor would it be the first time I have myself been caught in a similar trap. I have sent many a supposed invention to the Patent Office, to be told that the invention was older than him who claimed it. My communications upon the subject have hitherto been oral, partly for the reasons already given, and partly because I have never happened to get about it. And even now, my writing this paper is about as purely accidental as was the discovery of which it treats.

But notwithstanding I have not *written* anything upon this topic, I have never friled to talk upon it with every dentist who has expressed any interest in it. My theory and practice have ever been, that no *professional* has any right to withhold any fact or process from a professional brother, which would be useful to him, and which pertained to their common profession, nor to tie up such information

by a *patent.* I have procured, within the last twenty years, about thirty patents for my own inventions, but no one of them has, in the remotest manner, pertained to the profession of dentistry in *any* of its branches, notwithstanding I can claim to have furnished, both to the operating-room and laboratory, many things and appliances which I knew to be patentable. Indeed, the discovery about which I am now writing was a most proper subject for a very valuable patent. "Dow, Jr.," wrote what he called "patent sermons," but I never heard of his being a communicant in good standing in any *orthodox* church.

From 1840 to 1846, inclusive, I probably conversed with one hundred or more dentists upon the subject of this paper and freely communicated to each and all every fact which I now set forth. In 1846 I became connected with the Baltimore College of Dental Surgery, as Professor of Theory and Practice, and gave a lecture upon this topic before the students in February 1848. Having given notice to Professor Harris that I was to give such a lecture, he invited all the dentists of the city* to be present, and many of them were present. While I was discussing this special topic, if I could not discern most plainly upon the countenances of some of them the smile of derision, it was clearly that of unbelief. The "welding of gold," at common temperatures, seemed an absurd not to say ridiculous doctrine.

Among the gentlemen present at that lecture, was the late Dr. E. Townsend, of Philadelphia, with whom I had previously conversed upon this subject, and who had expressed a deep interest in it. He expressed strong desire to see this principle demonstrated by one who had had some experience in the matter, and gave me a pressing invitation to spend a day or two with him, at his house in Philadelphia, on my way home. To this I agreed, and instead of spending "a day or two," I spent a full week with him, and filled teeth each day from two to four hours. My first patient was the doctor himself. I filled a compound cavity for him, in an

* Baltimore,

upper molar, in which I put nine sheets No. 4 foil, which filling he carried with him to his grave. *

During each of these sessions there were present, on his invitation, several dentists to see (to use his own language) "Dr Westcott's new method of using gold foil." I have been a little particular in recounting these circumstances, as his reticence in regard to myself, in a paper which he read some years afterward upon this subject, might not seem to tally with these statements. I am unwilling to think that he intended to do me injustice, but simply forgot to mention my name in that connection. When I went to his office, as above mentioned, he had not a single plugger with serrated points, and he for the first time and under my directions altered several to meet this end. I doubt not that there are several gentlemen still in practice who can fully corroborate the statements made above, and if this paper should chance to meet the eye of either of them, I should be much obliged if they would communicate with me upon the subject.

From that day to this I have used "sticky foil," and, as I have already said, with various modifications, till my present practice varies widely from that first adopted with such foil. Now, for the sake of comparing notes with other practitioners, or to enable them to compare their practice with mine, and not for the sake of advocating any special practice, as the *ne plus ultra*, or of raising a standard which no one need aspire to, by some different mode, I will describe briefly my present manner of using gold foil; for, among the different discoveries which I have made, is that *many others* bring out just as good operations as I can, by my method of filling teeth, by modes and manipulations which would prove a perfect failure in *my* hands. But while I

* Since the preparation of this paper, in looking over my correspondence with Dr. Townsend, I find in one of his letters, dated July 9th, 1847, the following playful allusion to this filling. In alluding to a "Mr Lawrence" as the inventor of an appliance for holding napkins, he says: "You must recollect him as one of our party who stood over you at 'Broad Street House,' and saw you place that beautiful *door-plate* in my mouth which still gives out its golden lustre as brightly as at first." The doctor's allusion to this filling as a "*door-plate*," not only had reference to its great size, but its covering the whole anterior surface of the first upper molar, forward of which one or more teeth had been extacted: it could be seen at a considerable distance, whenever he opened his mouth, or even in ordinary conversation.

condemn no one's method, I may be allowed to prefer some one practice as having, in my judgment, advantages over others. Formerly, or in the early stages of my practice with adhesive foil, I used it to fill the entire cavity, whether great or small, but now make the following modifications:

1st. I seldom or never now fill a cavity entirely with adhesive foil.

2nd. I now use from eight to ten times as much *soft* foil, on the average, as I do adhesive foil.

3d. *I uniformly use both kinds in filling the same cavity*, unless it be a very small cavity, in which case I generally use adhesive foil only.

4th. *I uniformly use my soft foil in the form of cylinders*, varying in length, diameter, and compactness to suit the circumstances of the case.

5th. In each and every case I continue to use cylinders so long as I am sure that every part of the cavity can be reached by them, and they can be made as solid and secure as if done by pellets of either kind of gold.

6th. After the operation is carried as far as it can be with *certainty*, with cylinders, I then use firm but small-pointed instruments (pluggers) *with but little taper*, and pierce any and every part of the filling, and treat these permeations as new or original cavities. *These I fill with adhesive foil*, and this is now the only way or manner in which I use adhesive foil.

There are not a few good operators who have strong prejudices against the use of cylinders, but I am quite sure that their want of success in their use grows rather out of their want of practice with them, than from any inherent objection to their use. This may also arise from making them from improper foil, or from not knowing how to prepare and vary them so as to use them with certainty and ease.

In regard to the kind of foil of which cylinders should be made, it is a matter of the greatest moment that it be *soft* foil, in the strictest sense of the term. The most practiced hand will fail to do perfect work, if the operator is not care-

ful to secure foil which is *positively* soft. In regard to the size, length, etc. of these cylinders, common sense dictates that they must be varied to suit the size, shape, and depth of the cavity in which they are to be used; but one precaution must not be overlooked, viz;, *they must not be too large.* Better by far err in the opposite direction,—using more time and smaller cylinders. In any given operation we begin with a cylinder as large as can with certainty be introduced and perfectly packed, and continue by using them smaller and smaller, till they can no longer be inserted without crushing. They must never be so large as to crush before reaching the bottom of the cavity into which they are to be thrust, and when this can be no longer done with *certainty*, then is the time to stop the use of cylinders and begin with pellets of adhesive foil. In large cavities we shall, by adopting this rule, use from one-sixth to one-eighth as much adhesive as we have used of soft foil.

Next, in regard to the *consistency* of these cylinders. *They must not be too hard.* Operators, unless constantly on their guard, are apt to roll their cylinders too tight, and hence make them too unyielding. They are tempted to do this to facilitate their introduction, when they are to meet with a resistance which would crush them if made softer. But this *spiking* sort of operation will not do. No cavity was ever perfectly filled with *unyielding* cylinders or round rods. These cylinders must be sufficiently soft to adapt themselves readily by lateral pressure to any and every irregularity of the cavity, and when we cannot introduce cylinders of this character into any required place, then is the time to change off for pellets. With *any* cylinders, and especially in large cavities, it not unfrequently becomes necessary to *alternate with pellets*, in order to secure some point too small to be fully reached by gold in the cylinder form. After a cylinder is carried to its destination and fully packed, I hardly need say that it must never be allowed to stir from its bed. To overcome this difficulty, especially in *large and shallow cavities*, it often becomes necessary to use

the left hand as an assistant to the right hand,—the office of the plugger in the left hand being mainly to hold the foil already packed in the place, while more foil is being introduced and packed by the plugger in the right hand. There is no difficulty, with a little practice, in thus using the left hand in conjunction with the right hand, even packing with both at the same instant; and I take this occasion to urge all young operators, before their notions and manipulations become stereotyped, to *practice using both hands at the same time*, or at least learn to do so, and thus be ready to meet any emergency that may call for it.

I will now offer some of the reasons which have influenced me to adapt my present method of filling teeth as above described. My first and strongest reason is, that in a particular class of cases *I can reduce my operations to far greater certainty* than by any method which I have hitherto adopted. I refer to approximal and lateral cavities, and especially those occurring in bicuspid and molar teeth. The critical point in filling such cavities is, to fill perfectly (if upper teeth) the upper half or portion of the cavity, so that it may be left with a certainty that this portion of the filling is perfect and that it may be finished flush with the edges of the walls of the cavity. This done, and the lower half or portion is easily managed. But if there is the least imperfection about the upper margin, we can never return to it with any hope of afterward making it perfect. This is one of those bills that admits of no amendments short of striking out the enacting clause. In other words, whenever an operator finds, on examining such a filling, that its upper portion is imperfect, he may as well at once remove the filling and begin it anew.

In such cases I use as my first cylinder, one which, when fully compressed, will fill from one-third to one-half of the cavity, and which is thrust upward against the upper shoulder or wall; meanwhile, when necessary, holding it from any outward thrust by an instrument in the left hand.

After it is fully solidified by direct upward pressure, which

is done by a *foot-shaped* instrument, it is then and there held by the plugger in the left hand, while with the right hand we are enabled deliberately to make it more perfect by the use of one or more pellets, or by further packing any compressible portion of the cylinder itself. In short, we now substantially *finish* this portion of the filling, so far as the use of the plugger is concerned. It *must* be so left as to have no further occasion to use the plugger upon it. The operation, after this is accomplished in the manner described, is comparatively simple and easy, and may always be reduced to a certainty.

After the upper portion of the filling is completed, a firm compress of wood, paper, rubber, cloth, or any other material, may be carried up between the teeth, even covering in the main this finished portion of the filling to prevent any moisture from above reaching the part yet to be finished.

In this way we may fill the balance of the cavity with the utmost deliberation and ease, and free from all dread of being flooded before the final blow can be struck. This description applies to all lateral and approximal cavities, and indeed in a great measure to all cavities, wherever situated.

My second reason, and one which with me has great weight, is that, take cavities as they average, the work can be done by this method in one-half the time required to make equally good fillings with pellets alone. We sometimes hear dentists boast of spending a great length of time in performing operations, and perhaps on simple fillings, as if there was some peculiar merit in the fact. Should a surgeon boast of spending *hours* upon an operation which could have been as well and as safely done in as many minutes, no one would regard such an admission, not to say boast, as very much to his credit, and I unhesitatingly accuse any dentist who employs more time than is necessary to complete an operation properly, of wrongfully cheating both himself and his patient out of this valuable commodity—*time.*

Again, no dentist has a right to keep his patient in an

uncomfortable, not to say painful, attitude one moment longer than necessity positively demands; and as between methods or processes, other things being *equal*, that system should have the preference which secures equally good operations in the shortest space of time. In saying this, I by no means intend to encourage or *countenance* any curtailment of time that must bring with it any possible shortcoming in the perfection of the operation; but if one system of operating will materially lessen the time, without marring the result, it can but prove a benefactor to both dentist and patient.

This question of time has not only a strong bearing upon the comfort of both parties, but is of even greater moment when considered as an element of success or failure in performing operations. It not unfrequently occurs that in those cases where the saliva is uncontrollable for any considerable length of time, that the operator is enabled to do the first half of his filling well, and to his entire satisfaction, but fails totally in the last half, and consequently in the whole, by reason of a flood of saliva overtaking him at this point. Now if, by any plan or device, he could have completed his operation "before the flood," he would often avoid such a result, and save himself a panic which unfits him for operating even with ordinary rapidity and success; and it often occurs where, with ever so dexterous a use of wedge, strings, cofferdams, napkins, etc., this destroying flood submerges both our operations and our hopes, before we can by any possibility get out of its way.

After a practice of nearly a third of a century, I can truly say that any means calculated to avert, or outrun, the evils arising from that rapid flow of saliva which the dentist in many instances has to contend with, should be hailed with a joyous welcome, as relieving him of more than one-half of all the plagues incident to dental operations. But I have already trespassed upon the ordinary limits of such a communication, and far beyond my own intentions when I began this paper—*Dental Cosmos.*

MONTHLY SUMMARY.

The Perils of Fashion.—We are indebted to a lady correspondent for the correction of a mistake, or rather an omission, in our recent article on Tight-lacing. In ascribing the ungainly, feeble, and tottering walk of our modern fine ladies and their middle-class imitators to the decrepitude induced by tight-lacing, we omitted to mention another fashionable folly which assists in the production of this evil, and has also other sins of its own to answer for. The custom of wearing high boot-heels, and those too so much smaller than the actual heel of the wearer as to afford no solid support, but only a balancing-point, is a source of much mischief. In the first place, it throws the centre of gravity of the body so far forward that a free and gracefully erect carriage is impossible. Secondly, there being no firm support to the heel, ladies are very apt to twist the ankle suddenly by overbalancing themselves; and this is not only bad in itself, but the fear of its ocurrrence makes them assume a timid, mincing gait. And thirdly, the effect of driving the foot constantly forward into toe of the boot is to produce a very ugly and painful distortion to the great toe joint.

There is little need for wonder at the almost fierce contempt with which young men whose characters are at all above the lowest grades of conventional inanity regard the average "girl of the period." It cannot be denied that there is a significant correspondence between the æsthetic hideousness and the degrading effects on physical health which are produced by tight stays and crippling boots, and a certain mental and moral tone in female society of the present day, which is no less surprising than it is repulsive. The whole dress and carriage of our fashionable women, for several years past, has been modelling itself, with less and less concealment, upon the ideal furnished by Parisian *lorettes* of the consumptive Traviata type. It is not our business to set up as moral censors. But we may be excused if, for once in a way, we find it impossible to ignore the logical though repulsive consistency of the *grandes dames* and citizenesses who are willing to spoil their lungs and their digestions, and endanger their chances of happy maternity, for the sake of a wasp waist; to talk slang closely verging on indecency, for the

sake of the tenth part of a chance of catching a husband; and to simper and leer at the indecencies of a *Grande Duchesse de Gerolstein*, in order to escape the dreaded imputation of a deficiency in *chic.*—*Lancet.*

Amputation under Chloral.—M. NOIR relates this case more as a warning than as an example for imitation, although he suggests that some of the symptoms which arose might have been due to the idiosyncrasy of the patient. The man, 64 years of age, was an inmate of the hospital at Brionde on account of osteosarcoma of the tibia, which caused him such excessive pain that he eagerly sought for amputation. With the view of allaying his suffering, four grammes of solid hydrate of chloral were given him, which at first induced great agitation and much nausea, then gave rise to such deep sleep and great subsequent relief, that it was determined to employ this substauce as an anæsthetic next day during the operation. Accordingly five grammes were given, and in about two hours so deep a sleep followed that he was carried to the table and amputation performed without his making a movement or uttering a cry. Replaced in bed, still asleep, his body was observed to be very cold, and his pulse, which had been 120, became filiform and uncountable. He continued in a state of alarming coma until eleven and a half hours after the chloral had been administered. He then woke up in violent delirium, with vomiting and pain in the stomach. These symptoms continued for nearly eight hours, when they disappeared, leaving the patient in the extremest prostration. He was conscious, but could scarcely move or speak, and was ignorant of all that had passed. After some hours and a good night, though without sleep, all bad effects passed off.—*Gaz. des Hospitaux.*

Carbolic Gylcerine and Plaster.—DR. T. E. JENKINS, of Louisville, has writen the following note to Mr. Proctor, Editor of the *American Journal of Pharmacy.*

"During our sojourn in Europe in 1867, you may remember Dr. Lister of Glasgow, was experimenting with carbolic acid, with a view to its use as a surgical dressing. He found that one of the most convenient and efficient modes of applying this agent was to incorporate it with glazier's putty. This was a good idea, for

the putty is plastic, handy, cheap not uncleanly, and adapts itself well to any irregular surface. This close contact is advantageous in two ways—it brings the medicament in intimate connection with the parts to be healed, and it serves the important purpose of excluding the atmospheric air, with its myriads of germs of organisms, thus preventing the action, whatever it may be, of this supposed prolific source of trouble—spores floating in the air—upon sores and exposed denuded surfaces, to say nothing of the influence of atmospheric oxygen upon part of low vitality, and struggling to resist surrounding destructive agents and processes (its 'levelling' propensity?).

"This putty, however is not the best vehicle for the purpose intended, for it dries pretty rapidly and 'sets;' it becomes rigid and finally hard, thus getting into a condition calculated to do much harm and occasion great discomfort. Having been applied to overcome this difficulty, glycerine instantly suggested itself to me, and I proposed to make a putty with this valuable body instead of linseed oil. The experience of a year and more has established the great value of the improvement. The formula I framed gives a preparation possessing the proper consistence, and one which maintains its properties unimpared, when kept in close jars for a long time.

I. *Carbolic Glycerine.* (T. E. J.)

℞ Carbolic Acid,................. 1 part.
Glycerine,........................ 4 parts.

Mix.

II. *Carbolic Plaster.* (T. E. J.)

℞ Carbolic Glycerine 34 pts. by weight.
Prepared Chalk... 94 pts.

Mix well by kneading, and enclose in closely stoppered jars.

"This preparation will, I think, be found to be all that is desired."

Solutions of Protoxide of Nitrogen.—M. Stanislas Limousin has published a long paper on protoxide of nitrogen, which presents several points of interest for pharmaceutists at the present time, because this gas has been a good deal employed recently to produce anæsthesia, more especially for dental operations.

After referring to the general history of the gas, M. Limousin

states that, in the course of some experiments in 1866, he was much struck by the great solubility of protoxide of nitrogen in water. Having one day a bottle containing equal volumes of the gas and cold water, he was surprised to find that upon violent agitation the stopper was forced down into the bottle with a detonation. Upon repeating his experiments, he found the water, (at about 4° or 5° C.) was capable of dissolving its own volume of the gas at the ordinary atmospheric pressure. This solution has a pleasant, slightly sweet taste, and is more agreeable to drink than pure water. It communicates this particular taste to wine and other liquids with which it is mixed. When the solution is affected under pressure, several volumes of gas are dissolved by the water, and this sweetness becomes more manifest. The author finds this solution of the gas to be perfectly innocuous; he has drunk it in doses of two bottles a day, sometimes pure, sometimes mixed with wine, and it has produced only a slight excitement and sensation of warmth to the head, somewhat similar to the effects of alcohol.

Dr. Demarquay has also studied upon himself the effects of this solution. He has taken it for several days, and he states that it produces upon the digestive functions a very marked stimulant and aperient action.

M. Limousin also directs attention to the solution of protoxide of nitrogen in ether. He finds that when ether is maintained at a temperature of—12° C. by a freezing mixture, it is capable of absorbing eight times its volume of nitrous oxide. Prepared under these conditions, the saturated ether acquires remarkable properties. It volatilizes with so much greater rapidity than pure ether, and produces thereby such a diminution of temperature that it would probably produce very energetic effects if applied to produce local anæsthesia. A mixture of strong alcohol and ether, saturated with protoxide of nitrogen, introduced upon cotton into a decayed tooth, produced momentarily an instantaneous disappearance of the pain. The vapor of this ethereal solution possesses a slightly sweet taste. Introduced into the lungs it produces a very agreeable peculiar sensation, and loses the sharp irritating taste of ether inhalations, which, with some persons, augments the nervous excitement.

M. Limousin also details a number of experiments intended

to assist in forming an explanation of the physiological properties of nitrous oxide. He shows that this body is in fact a somewhat unstable compound, decomposed under comparatively feeble influences into oxygen and nitrogen; he regards it therefore as an oxidizing substance, and capable of acting as such when introduced into the animal economy. In the course of his paper the author mentions that bags or vessels of caoutchouc cannot be used for the preservation or transference of the gas, because this substance allows a very rapid diffusion of the gas to take place. *Druggists Circular.*

Furrows on the Nails as the Result of Illness.—In a recent number of the *Lancet*, Samuel Wilks, M.D., Physician to Guy's Hospital, mentions the fact that the traces of a past illness are indicated by markings or furrows on the nails. His own distinct knowledge of the fact that the nails become altered in disease was obtained, when a non-professional gentleman observed the circumstance for himself, and was so much interested in it that he referred the matter to a distinguished natural philosophor. It was after a severe attack of diarrhœa, which caused almost as much prostration as Asiatic cholera, that he discovered a white line or depression at the roots of the nails. Having formed a pretty accurate idea of their rate of growth, he was convinced that the markings corresponded with the date of illness. These marks are caused by a slight furrow, which is found more especially on the middle of the nail, and more distinct on that of the thumb. They point, no doubt, to a sudden arrest of the nutritive process during the time of the illness, and herein lies the interest of the observation. In cases of fever it is known that the most profound changes take place in all the tissues of the body. In scarlet fever, the whole of the epithelial surface within and without the body is affected, and, as a result, we may witness a desquamation of the cuticle, falling of the hair, and separation of the nails. When the fever is at its height, we can have then little doubt of the changes taking place in the tissues, and can feel no surprise that the nails show evidence of the former conflagration. As the patient recovers, and a new cuticle forms, and the hair begins to grow, the nail proceeds to shoot forward afresh, and it s not long before the latter exhibits a transverse furrow, indica-

tive of the previous illness. It is possible, therefore to ascertain the date of the attack. Physiologists say that the thumb nail grows its whole length twice in a year, and thus it follows that if the furrow be found in the middle of the nail, the illness occured three months before. This fact may serve for a limited period, like "foot prints on the sands of time," as some additional proof of previous serious illness. For instance, a patient with a cardiac disorder stated that he had an illness three months before, and on his nails some transverse markings were found; also another suffering from phthisis said that his illness resulted from an inflamation of the lungs, occurring a few weeks previously, and on his nails also some distinct lines were discovered. That a severe diarrhœa could produce such a cessation of the nutritive process as to exhibit its effects on the nails, is a fact for which he was unprepared had it not been apparent to his eyes. In conclusion, he promises to present to his fellow-practitioners at some future date, further accurate clinical observations with reference to the subject.—*Medical Record.*

Why do we Oil our Whetstones?—GREAT men sometimes give utterance to arrant nonsense. Professor Tyndal, in his work, *Heat considered as a Mode af Motion,* asks the same question that we have placed as a caption to this note, and replies, in general terms, that it is to prevent friction. We have seen it stated somewhere that a little carbolic acid dissolved in water which is used to moisten a whetstone or grindstone, will greatly increase the amount of friction, and thus promote the action of the stone on the steel instrument. If this he true, and there be no unforseen drawback, carbolic acid will prove invaluable to all who have to sharpen tools or grind metallic surfaces. We oil our hones for several reasons. The first is, that almost all stones, unless oiled, become glazed or burnished on the surface, so that they no longer abrade the metal. The second reason is, that most stones, after being oiled, give a finer edge than they do in a dry or merely wet state. The pores of the stone become in a measure filled up, and while the action is rendered continuous, its character is altered. A dry stone is very apt to give a wire-edge to a tool, and although this sometimes happens when oil is used, yet it does not occur nearly so often. Some stones work better with water than with oil.—*Druggists Circular.*

Skin Diseases.—The following formula as an application in skin diseases, attended with little discharge, will be found satisfactory.

℞ Ferri pulv., ℥j.
Cinchonæ rubræ pulv., ℥ss.
Boracis pulv., ʒij.
Ol. Morrhuæ, q.s. for unguent. M.

A combination which forms a coating as impervious to air as collodion, and which the writer has employed with happy results in several cases of eczema, is prepared by adding ʒij. quiniæ sulph. to ℥ss. aa. tinct. ferri. chl. and tinct. cinchonæ, the parts to be painted with two or three coats.—*Med & Surg. Reporter.*

To Prevent Tetanus—To relieve from the terrible effects of running a nail in the foot of a man or horse, take peach leaves, bruise them, apply to the wound, confine with a bandage. They cure as if by magic. Renew the application twice a day if necessary, but one application usually does the work.—*Druggists Circular.*

A New Cement.—The "Journal de Chimie Medicale" states that an excellent cement may be made by dissolving 1 part of amber in 1½ part of sulphide of carbon. This liquid is applied by a brush to the surfaces it is wished to unite, and on pressing them together the cement dries almost immediately.—*Druggists Circular.*

EDITORIAL DEPARTMENT.

The Annual Commencement of the Baltimore College of Dental Surgery.—The *Thirtieth* Annual Commencement of the Baltimore College of Dental Surgery was held at the Concordia Opera House, on Wednesday evening, March 2nd, in the presence of a large audience. Every seat was occupied on the floor and in the galleries, by the friends of the graduates, the majority of whom were ladies. At 8.30 P. M, the members of the graduating class preceded by the Faculty and followed by a number of distin-

guished guests, among whom were representatives from the two Medical Colleges of Baltimore, entered upon the stage. After some choice selections of music, executed by the Blues Band under the direction of Prof. Holland, the exercises were opened with prayer bv the Rev. J. B. Fitzpatrick of Virginia.

Professor F. J. S. Gorgas, the Dean of the Faculty, then read extracts from the act of incorporation granted by the General Assembly of Maryland in 1839, empowering the Faculty to confer the degree of Doctor of Dental Surgery on all students who shall have complied with the rules of the institution and then announced the names of the graduates. After music, the graduates came forward as their names were announced, and were presented with their diplomas by the dean, who, by virtue of the authority committed to the Faculty, conferred upon them the degree of "Doctor of Dental Surgery," with all the rights and privileges pertaining thereto. The following is the list of graduates for 1870:

Louis Augspath,..*Russia.*
William Robert Ballard, Jr., D.D.S.............*England.*
William Henry Bennett,..........................*Tennessee.*
Clinton Thomas Brockett,..........................*Maryland.*
Benjamin Holliday Catching, ...*Mississippi.*
Alexander Dunnington Cobey,...................*Maryland.*
Abraham F. Cox,...................................*Virginia.*
John Henry Coyle,..................................*Georgia.*
Kurwin L. Eisenhart,........................*Pennsylvania.*
Edward Stabler Fawcett,..........................*Virginia.*
Hillary Edgar Hardey, ...*Maryland.*
Louis Summerfield Ledbetter,.....................*Georgia.*
James Henry Ludwig, M. D.,..................*Maryland,*
Jonathan Magruder,...............................*Maryland.*
John William Meng,...............................*Missouri.*
Eber Rice Perrow,...................................*Virginia.*
Oscar Ernst Moritz Salomon,.............*North Germany.*
Thomas James Speck,.............................*Tennessee.*
David Franklin, Swengel,...................*Pennsylvania,*
Henry Grove Ulrich,..........................*Pennsylvania.*
Andrew Park White,..............................*Tennessee.*
John Thompson Wilson,............................*Virginia.*
Thruston Wolfe,.......................................*Virginia.*
W. Tryon Yarbrough,.............................*Mississippi.*

The Valedictory Address was then delivered by Dr. M. J. DeRosset, Professor of Chemistry, who impressed upon the graduates the importance of continued study, gave some excellent advice to those about to enter upon a professional life, and asked them to uphold the honor of their Alma Mater at all times. This address was followed by one on behalf of the graduating class, delivered by Dr. B. H. Catching, of Mississippi, a member of the class, which was well written and also well delivered. The graduates were the recipients of a large number of handsome boquets from their lady friends, and every thing passed off in the most happy and agreeable manner. The exercises of the Commencement were concluded by a benediction, and thus another session of this *pioneer* of Dental Colleges ended.

Poisoning by Tincture of Aconite.—As this preparation, in combination with other agents, is now a favorite remedy with many practitioners in the treatment of alveolar periostitis, &c., and from that fact that it is a poison, it is very essential that all who make use of it should have a knowledge of its properties and the antidotes, where such may be required.

It is not unusual for patients to be supplied with a quantity of the mixture, of which the tincture of aconite is one of the most active ingredients, to enable them to make frequent local applications at their homes, and for convenience the bottle containing it is often kept upon the dressing table, and hence liable to be swallowed in mistake for some innocent preparation.

Hence the necessity for impressing upon our patients the importance of care, both in regard to the use of this agent, and its safety at their homes.

Dr. B. W. Richardson, of London, was lately called in haste to see a lady, aged 25 years, who, while suffering from severe facial neuralgia, swallowed through mistake, instead of a tonic mixture two tablespoonfuls of an aconite mouth lotion, her mouth being at the time benumbed by a previous use of the lotion to the gums. The mixture was swallowed at 11 o'clock A. M., and she visited several stores and did not reach home until half past twelve o'clock P. M., when she became alarmingly ill, staggered on attempting to walk, and was seized with a fearful benumbed tingling in the lower half of the back, then in the face and head, while at the same time the tingling in the mouth became developed. The head felt as if it were distorted by the pressure of a vice, and a sensation of tightness across the nose and eyes was most distressing. In a few minutes more, the legs became so weak, and such tremor came over her, that she could not stand without assistance. She was conveyed immediately to the house of an acquaintance in the neighbourhood, her friends being under the impression that she was too prostrate for the

drive home, a much longer distance. She was placed upon a sofa. The debility had become so great that she fainted on three or four occasions in attempting to set up. Benumbed tingling of both the upper and lower extremities commenced at half-past one o'clock P. M., and vision became very imperfect, a blackness, as she described it, having come over the sight. A little time afterwards, vomiting of an olive-yellow-coloured fluid commenced, and was almost incessant up to seven o'clock P. M. Towards evening she was greatly collapsed, and having fainted when in this state, her friends fancied that she had expired."

Dr. Richardson gives the following account of his treatment:

"The pulse was felt with difficulty at the wrists, and the heart's action was weak and irregular. I gave her immediately some warm brandy punch, and, in a few minutes afterwards, a mixture composed of aromatic spirit of ammonia, sulphuric ether, tincture of ginger, and camphor mixture. A sinapism was placed over the heart, and one upon the calf of each leg. The punch and the mixture were not retained upon the stomach.

She was pulseless at ten minutes to seven o'clock, and the extremities were cold as death. The pupils were much dilated. The intellect continued unimpaired.

It being obvious to my mind that death at the heart had commenced, I resolved to inject hypodermically twenty-five drops of liq. ammoniæ; but as the time that would be required to procure my own syringe might be a fatal loss to the patient, I sent to a neighbouring cutler, who was kind enough to send me one in a few minutes.

Seven o'clock P. M., I injected half a drachm of liq. ammoniæ under the skin, corresponding to the insertion of the right deltoid muscle.

Ten minutes past seven o'clock: Vomiting not so frequent; but the stomach will not tolerate the stimulants. She continues collapsed and very cold; forehead covered with sweat, eyes glassy, and pupils are much dilated; tongue pale and contracted; no trace of pulse at the wrists: intellect unimpaired. Injected half a drachm of liq. ammoniæ under the skin of the outside of the right arm, about midway between the elbow and seat of the first injection.

Twenty minutes past seven o'clock; Vomiting at longer intervals; still pulseless at the wrists, and no sign of return of warmth in the extremities; complains constantly of the compressed and distorted feeling of the head; pupils have continued of the same size. Injected half a drachm of liq. ammoniæ under the skin of left infra-scapular region.

Twenty-five minutes past seven o'clock: Pulseless. Injected half a drachm of liq. ammoniæ under the skin a little below the middle of the outer part of the left arm.

Half past seven o'clock: While my fingers were applied over the course of the radial artery, at the wrist, searching for a pulsatiou, I fancied I felt a weak, irregular, thready beating of the vessel. In a few minutes this became no longer doubtful, but gradually stronger and stronger.

Eight o,clock: Pulse fully established, but a little irregular; vomiting has almost ceased; extremities warming; tingling of the skin and compressed sensation of the head and face no longer felt. The tingling, however, of the extremities, although not so decided, did not cease until half-past twelve o'clock next morning; and that of the lower lip continued until November 28.

In cases in which death is to all appearances impending, I should not like to lose time in trying to limit the injection to the vein, as suggested by Professor Halford, in poison from snake bites, and would rather take the chance of a sufficient quantity of the ammonia being absorbed from the areolar tissue before its local action takes place, the chief objection to this procedure. Of the four injections made under the skin in Miss B.'s case, but one caused subsequent annoyance, the cutaneous eschar that resulted from it being about the size of one of our new halfpennies. There being no doubt that the symptoms were caused by tincture of aconite, the important matter to ascertain was the quantity that had been taken. I therefore made the necessary inquiries on the point, and learned that the lotion, if made according to the directions for compounding it, should have contained one drachm and a half of the tincture in every fluid ounce. Of this lotion Miss B. took two tablespoonfuls, as already mentioned.

Whether or not the late appearance of the symptoms was owing to the tincture being a weak preparation, or to the fact that it had been taken immediately after breakfast, or even to some peculiar idiosyncrasy, are matters for conjecture. At all events, when they were established, they were of the most alarming nature, and portended approaching death."

Large quantities of animal charcoal are also beneficial in cases of aconite poisoning, as the charcoal absorbs the agent readily.

Southern Dental Association.—This Association will hold its second annual meeting in New Orleans on the 2nd Wednesday of April next. There is every reason to believe that this meeting will be attended by a very large number of the dentists of the Southern States, and prove highly interesting and instructive.

We trust all will attend who can by any possible means make arrangements to do so, as we feel certain they will be well received by the members of the profession in New Orleans, and everything done to add to their comfort and enjoyment, and make their visit to this beautiful city a pleasant one.

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ARTICLE I.

*Hyperaemia and Inflammatory Exudations of the Mucous Membrane of the Mouth.**

By A German, D. D. S.

I intend to divide this disease into five classes.

1st. Inflammation of the mucous membrane or stomatitis simplex.

a. Caused by Vegetable Parasites.
b. Caused by Syphilitic Affections.
c. Caused by Mercury.
d. Caused by Corrosive Remedies.

2d. Stomatitis Vesiculosa et Pustulosa.
3d. Stomatitis Ulcerosa.
4th. Stomatitis Folliculosa et. Aphtosa.
5th. Stomatitis Gangrænosa, Gangraena Infantilis, Noma.

* AUTHORITIES:—Buzer Zahnheilekunde: Prof. Albrecht, clinic der Mundkran ksseiten; Bcuchut Mannel Pratique des Maladies de nouvean—nes; Vogel—allgemeine Zeintung fur Chirurgie; Reubold, der Soor, . Virchow's Archiv xxx. 1864; Smoler Medical Gazette of Vienna 1851; Gazette Med. d Orient; Bauden's Crimelan War; Journal von Graefe und Walter, Pourdes der Noma, ou du Sphacele de la Couche chez les onfant Strasburg, 1848.

1st. *Stomatitis Simplex, Pathological Anatomy and Symptoms.*

The mucous membrane of the mouth appears inflamed in separate spots, for instance: at the follicular openings, or the whole surface is in the condition of inflammation, partly deprived of its epithelium. At times increased secretions are observed with abrasions of the surface.

The inflammation of the mucous membrane of the cheek renders mastication difficult, and in children interferes with their suckling, and in consequence of the swelling the shape of the teeth are impressed upon the substance of the cheek. The papillae of the tongue are very frequently injected, and at the margin are indented with the form of the teeth; the taste is generally altered and characterized by intense bitterness.

Should the affection appear on the gums, the sensation of tickling and burning is complained of.

Swelling of mucous membrane of the uvula brings on continued gulping and obstinate coughing.

When the disease becomes extensive, the taste is repugnant, and the breath offensive. Only among very sensitive individuals, and especially among children at the breast, we find general symptoms of headache, fever, restlessness and the other signs of hyperæmia of the brain.

Aetiology. Uncleanliness, parasites, hard sucking, diseased mammaries, cutting of the teeth, are the causes of the affection in suckling children. In other children and adults we also have local irritation like that from foreign bodies, sharp edges of teeth, loose roots, and ill formed clasps, biting of surround ing tissues, salivary calculus, parasites and cauterization, the excessive use of alcohol and tobacco. Constitutional symptoms, such as poison by mercury, iodine, cantharides and phosphorus, also infections in measles, scarlet fever, small pox, syphilis, typhus, etc.

Diagnosis. It is not always possible to determine the origin of the disease from the degree of inflammation; notwith-

standing this, the cause can be immediately established by the characteristic clinical symptoms of many forms of stomatitis.

a. Stomatitis Simplex

caused by vegetable parasites upon the mucous membrane of the mouth, thrush, scer, muguet. A small confervæ, oidium albicans, generated from an accumulation of round sporules elevated on the surface of the mucous membrane, and between the lamella of the epithelium. It forms sometimes single, sometimes confluent opaque spots, which are easily detached but quickly reproduced. They are most frequently observed on the anterior portion of the fauces, the inner sides of the lips and cheeks, on the gums, and on the margins of the tongue. Occasionally the whole cavity of the mouth and the pharynx are covered with this vegetable growth. The eruption is often found in infants less than a mouth old, being in them a mild affection; sometimes, however, it appears in adults, generally after some acute or chronic affection, and then characterizes the fatal disease. In both cases this vegetable growth is accompanied by a nauseous stomach. The pains or symptoms, are in general very slight so that infants are seldom prevented from suckling or swallowing. The thrush of adults seldom produces any unpleasantness but is remarkable for the disagreeable odor of cradle milk.

b. Stomatitis Simplex, caused by Syphilitic Infection.

It makes its appearance in small oblong light gray spots, which consist of the dried upper layer of the epithelium. Small furrows appear in the epithelial layer, between which the red tissues are again seen. The general location of this affection is principally the mucous membrane of the lips, but sometimes it appears on that of the cheek, the margin of the tongue and the fauces. Swelling of the glands is not a constant symptom.

c. Stomatitis Simplex, caused by Mercurial Poisoning.

Before the appearance of salivation, an opaque coloring,

shows itself in the mucous membrane of the gums, and contrasts strongly with the red tissues, which is caused by the thickness and opaqueness of the affected epithelium. On the mucous membrane of the cheek, we frequently, at the same time, observe a thin white fur, which is also often called mercurial sore.

d. Somatitis Simplex, caused by Corrosive Remedies.

The application of caustic substances to the mucous membrane of the mouth, especially the use of creosote by unskillful persons, are frequent causes of stomatitis. They produce an opaqueness of the upper layer of the epithelium, which is easily detached with the finger, after which a dark colored and bleeding surface is seen; other acids and alcohol produce the same affects as creosote.

Treatment. In treating stomatitis the first step is to remove the irritating causes, should the confervæ be the cause, cleanliness and good nourishment is the best means of treatment. Should the vegetable not be great, the best way is to wash them off with cold water, or paint with a weak sotion of sulph. of copper, or still better apply cerax 1 part and honey 3 parts.

In mercurial stomatitis, the administration of mercury being stopped, the disease will disappear of itself; if not it should then be treated with a weak solution of chlorate of potash. The syphilitic stomatitis being treated by cleanliness, will sometimes spontaneously disappear. Should it not do so, however, an anti-syphilitic treatment will invariably overcome the disease.

2d. *Stomatitis Vesiculosa et Pustulosa.*

The elevation of the epithelium by an accumulation of serum characterizes the vesicular inflammation. Should the serum assume the character of pus, we have pustules and with them a pustular inflammation.

Vesicles are produced by local irritation, cautery &c., especially on the point of the tongue; occasionally no local

irritation can be determined, and we then have an eruption, forming on the lips, like herpes. Herpes labialis, olophlyitis prolabiales, as in pneumonia, bronchitis and gastric catarrh, but never, as Prof. Skoda affirms, in typhoid diseases. On the second or third day the opaque, alkaline fluid of the vesicle clears and is gradually absorbed. The residue with the thin skin of the vesicle forms a small yellowish crust, which falls off about the seventh or eighth day, and leaves a minute red spot, which disappears in a short time.

The treatment is expectant and only calls for the administration of quinine, when the erruption is accompanied by neuralgia (as in the interesting case mentioned by Leoni).

Pustules frequently occur in small pox after the use of tartar emetic in large doses, sometimes spontaneously changing from vesicles to the formation of ulcers. Such pustules are of no gravity, and generally disappear without any further treatment.

3. *Stomatitis Ulcerosa.*

We distinguish ulcers, produced by local irritation, those by constitutional causes, and others partly by local and partly by constitutional causes.

The most frequent ulcerations produced by local irritations are those caused by sharp edges of teeth, and old roots remaining in the mouth, clasps, and also by perforations of the alveolar processes by the roots of teeth. They are also often caused by mechanical injuries, viz: extractions with the key, from undue pressure, injury of the gum by an antagonistic tooth; cutting of wisdom teeth, and finally isolated teeth in the old.

Chemical and heating applications, are sometimes also the cause of these ulcerations, generally applied through carelessness or with criminal intention. The careless application of creosote to an aching tooth, or the burning of the mucous membrane by the introduction of hot food are frequent causes. The injuries range from the simple abrasion of the surface, to the injury of the deeper tissues, attended by inflammation and swelling of the neighboring glands.

The treatment consists first in the removal of the irritating cause, such as the extraction of the teeth and roots, &c., and the application of mild, lukewarm gargles. Should the di sease not yield, the application of astringent washes is advisable, among others, alum, rhatany, tannin, &c. Fistulous ulcerations are to be opened. In the healing of ulcers of the gums and cheek, which come in contact, the introduction of small pieces of sponge or lint to prevent the adhesion of the touching surfaces, is advisable.

Of the ulcers produced by constitutional causes, the scorbutic, the mercurial, and the syphilitic are the principal.

The ulcers in scorbutic affections are mostly found on the gums, and in very few cases do they attack any other part of the mouth, they are characterized by flat, livid, oedematous edges, a dirty base from which spongy, easily bleeding, granulations spring up. A secretion of disagreeable odor followed by altered blood is also observed to exude. As the disease advances, the teeth become loose, the ulcers assume a grayish hue, and attack the other parts of the mouth; occasionally they ever perforate the cheek and the tonsils; the parotid glands are affected, and it at length ends in caries of the exposed bone.

The first step to be taken in the treatment is the removal of the cause, after which citric acid, green salad, &c., might be administered. During the Crimean war salad made of the (taraxacum officinale linn) was used at meals as a vegetable, being thought an admirable remedy against scorbutis. The administation of good beer, is also recommended. Oppolyer recommends:

℞ Decocti Malti Unc. ½, ad Unc. 6
Fermenti Cereviciae,
Oym. simpl. ana Unc. ½

M. S. A tablespoonful every 2 hours.

In slight cases, locally an astringent wash may form the whole mode of treatment. In graver ones the application of weak solutions of nitric acid, or lapis infernalis suffices. Hippocrates advised the chewing of twigs of myrrh. The

ulcers produced by the administration of mercury, first appear on the gums, and the inner walls of the lips, they then spread to the tongue and the cheeks. On the gums they attack the free margins and are covered with a filthy secretion, and are generally quite painful without being particularly different from other ulcerations. But, nevertheless, some symptoms should not be passed over without mention, such as the more or less violent salivation, the highly disagreeable characteristic odor, the effect on the teeth, and other symptoms of mercurial salivation, more so than the simpler ulcerations, is followed by a growing together of the substance of the gums with the cheeks; sometimes perfect atresia oris is established.

The object of the treatment is to get rid of the mercurial salivation, by penciling and cauterizing with nitric acid. The internal treatment consists in the administration of chlorate of potash, one drachm, in divided doses, per day. Adhesion of the substance of the gum and cheek require operations, and are to be kept apart by lint, cauterizing with nitric acid etc., in order to prevent readhesion. It is often very difficult to secure this result as the tendency to reunite is very great, sometimes over-growing the lead wires applied according to Padtorfer.

The syphilitic ulcers are generally situated on the gums; they are, however, sometimes found in the corners of the mouth and on the cheeks.

They form sharp edged ulcers with a fatty looking base to which a yellow secretion adheres. The ulcers are sometimes surrounded by an induration of a dark, frequently coppercolored, inflammation. Sometimes this symptom is, however, not present and the disease cannot be so readily diagnosed without the presence of other syphilitic affections (as condylome), or by the results of a specified treatment. If the disease is not too severe, a simple local treatment will suffice. The use of weak astringent washes and gargles, and the application of lunar caustic are followed by a good result. In most cases, however, in order to thoroughly relieve

the disease, an antisyphilitic treatment must be instituted. In such cases, with adults, the administration of the hydrargyrum Iodatum gr. ss. pr. die. is recommended. In children a dose of calomel gr. ¼. night and morning, or the application to the skin of ung. ciner. gr. 5-8. at night, followed by a warm bath in the morning is thought to be an efficient mode of treatment.

Ulcers produced partly by local and partly by constitutional influence are presented by the

4. *Stomatitis folliculosa. s. aphthosa.*

The follicular inflammations of the mucous membrane of the mouth are most frequently found in children, but sometimes also in adults. They generally attack the mucus follicles of the mouth. As a rule the sore begins by the appearance of an elevated pale looking vesicle, of a white or yellowish color, which, after bursting, exposes a small ulcer (Aphtha) with red edges and a yellowish gray base. In about a week or ten days this ulcer cleans up and cicatrizes. Their favorite places of attack are the inner surface of the lower lip and the cheeks, the margins of the tongue and the mucous membrane of the gums.

The causes of this disease are very obscure. As one-half of the number of all observations fall in the second year of life, and as fully two thirds of them are between the ages of 5 and 30 months, it would point to the time of the first dentition. But we also have them in typhus and puerperal fevers, and in the course of many severe acute diseases. This disease itself involves no unfavorable prognosis. The symptoms vary according to the number of the ulcers. In little children the appearance of a great number of these sores produces fever, gastro-intestinal catarrh, swelling of the neighboring lymphatic gland, etc., in adults they are very frequently the cause of excesive burning pain, and when the disease lasts a longer time, disturbance of nutrition. The best means of cure is the application of lunar caustic.

5. *Stomatitis gangraenosa, Gangraena Infantilis, Noma.*

The gangrenous mouth, very inapropriately called noma, since the time of the Dutch physician Van der Voorde, in the 17th century, consists in a very rapidly increasing gangrene of a part of the soft tissues of the mouth, the formation of a filthy exudation, indicative of the fast destruction of the tissues, and the consequent general symptoms, frequently ending in death.

The disease commences with the formation of a livid red spot on some part of the mucous membrane of the cheek, most frequently on the left side, at which spot the epithelium rises into a small vesicle. At the same time the cheek begins to swell, and a central cone is formed surrounded by an elastic, and less pliable tissue. The cheek at this place is tense and shining, as if covered with oil, but nevertheless not so hard and unyielding as to prevent the mouth being opened for an examination.

In the middle of the swelling, a spot of a dark red color now begins to grow darker, and to increase in circumference, and the swelling gives way to a shaggy, pulpy, dark brown mass. The corresponding spot in the mouth is changed into a deep ulcer, with irregular jagged edges and a dirty dark brown base, the neighboring gum is in a similar condition, the teeth are loosened and fall out one after another. The salivary secretion is increased, while the exudation, at first clear, becomes cloudy and of an offensive odor, and finally the sympathetic glands swell more and more.

As a rule the pains are not very severe, the patients feel sleepy, and death is very easy, often occuring before the gangrenous part sloughs off.

This terrible disease is generally only found in children between the ages of two and five years, occuring more frequently in girls than in boys. More cases occur in cold climates than in warmer ones. Poor living and severe attacks of illness, principally of measles, typhus, and tuberculous affections appear to have a decided tendency to produce this disease. The real cause of this affection is not known.

Treatment, 1. Cauterize suspicious looking ulcers in time, with lunar caustic or nitric acid.

The following wash has been used with success:

℞. Bromi Puri, gr. vj.
Kali hydrobromi, gr. xxiv.
Aquae destillatae, ℥ ss.
M. S. To be sprinkled on ulcerations.

2. Endeavor to keep the mouth and ulcer clean, by the application of lukewarm aromatic washes and gargles as for instance:

℞ Infusi Specier, aromatic de ʒ ij.
Creosote puri ggt. j.
M. S. Gargle.

3. Administer internally Potass. chlor. and good nourishing food.

ARTICLE II.

A Novel Case and Treatment.

By Dr. S. J. Cobb, Nashville, Tenn.

A lady, who was so unfortunate as to lose, at the age of twenty, all of her upper teeth except the three roots of the second left superior molar, over which she has worn a plate for ten or twelve years, called upon a dentist a short time ago for the purpose of having her plate refitted, and he very naturally suggested the necessity of removing these loose roots from the mouth, which she readily consented to, and in his efforts to remove them pushed them up into the antrum. The operation becoming a little painful to the patient and frightful to the operator, was no longer persisted in, but in about eight hours from that time they were blown out at the nose.

I presume the floor of the antrum covering these roots had been necrosed and partially exfoliated for two or three years, from the fact that she has since called upon me to operate and treat for diseased antrum. In diagnosing the case, I found from necrosis and exfoliation not only the

floor of the antrum covering these roots destroyed, but a portion of the ethmoid and inferior turbinated bones, making an opening sufficiently large for these roots to pass into the nasal fossa, from which they passed out at the nose. I also found there had been a constant, copious fetid discharge through the nose for five years, following an attack of erysipelas of the face.

In operating I removed all of the necrosed and exfoliated bone, after which I passed well up into the parts a small piece of sponge thoroughly saturated in two parts carbolic acid and one of tinc. of iodine. I then diluted with soft water the acid and iodine solution, and syringed the parts well and sent my patient home, with directions to use as a wash for the parts the compound of acid, iodine and water, also to keep the parts well cleansed with tepid water, and take in the way of general treatment, ten grains of blue mass, followed by one or two doses of citrate of magnesia, after which to take three times a dose of twenty drops of syrup of the iodide of iron. For two or three days after the operation the discharge slightly increased as I anticipated, having used the strong solution of acid and iodine for the purpose of producing a sufficient sloughing to bring away such small detached pieces of bone as might remain somewhat attached to the soft parts. In the course of a week the discharge commenced decreasing rapidly, at which time I fitted a plate and teeth to the jaw, covering the part well for the purpose of keeping particles of food and other matter out of the antrum.

At the end of twenty days treatment the discharge ceased entirely, and upon examination the secretions were found to be as healthy as they ever were.

ARTICLE III.

Effects and Treatment of Salivary and Mucus Deposits.

By Louis Augspath, D. D. S.

There is, doubtless, in the whole range of causes nothing which exerts a greater influence upon the profession of den-

tistry than the neglect, on the part of the mass of mankind, of proper care of the teeth and mouth.

A want of care is beyond all question, the source of most of the diseases and evils to which the teeth are subject. There is, probably, nothing which more properly claims the attention of the intelligent dentist than the subject of deposits, including the calcareous formation usually denominated *Tartar, and the Green and Brown Stains*, and all those impurities on the teeth which are produced by neglect, tobacco and other similar causes.

It is well understood that there are different varieties of tartar, characterized by color, composition and consistency, but all produced by the same cause and resulting as a precipitate of the saliva, in connection, possibly, with deposits of the mucus.

Persons of all ages are subject to deposits of tartar, although it seldom appears before children have erupted their six year molars, but continues to be formed throughout life; and often to such a degree, that teeth may be found nearly if not entirely covered with it, especially in persons who have been repeatedly and severely salivated, or are of a dyspeptic or scrofulous diathesis. In some persons tartar is deposited throughout life, while others are exempt until some constitutional change takes place when it is rapidly eliminated. This deposite in its direct action on the tooth, in regard to health, is innocent, as it is an exterior formation on the surface of the tooth, and serves rather to prevent than to produce decay. On the other hand it is well worth the notice of the dentist and should never be allowed to remain, as from its tendency to increase on the most protected points, it will naturally force the gum to recede, the alveolar process to absorb (where there is pressure there is absorption), and if left unmolested will not only loosen the teeth but finally cause them to drop from their sockets.

Green and brown stains, doubtless, are caused exclusively by the mucus. This stain is not, like tartar, a formation on the tooth, but enters into the composition of the enamel and

tends to produce decay and the destruction of the entire tooth. To this disorder young persons are especially liable, as the enamel is of a lower order of density and the acids of the mouth will therefore act upon it with greater rapidity than in more advanced age.

As a general rule the anterior superior incisors are most liable to be attacked by this disease, owing to their position in the dental arch, where the saliva is only sparingly retained, and where the cleansing if not polishing action of the tongue is almost entirely excluded. This will to some extent account for the reason this disease selects the labial surface in preference to any other.

The remedy for the former of these diseases (tartar) is purely mechanical, but for the latter (stain) it may be necessary to combine the mechanical with therapeutic treatment.

Giving attention first to tartar, I shall endeavor to explain the modus operandi in relieving the teeth of these disagreeable and destructive affections. There are two methods of removing salivary calculus from the teeth: the one by mechanically decomposing the deposit by the use of some acid, the other, mechanical, by scaling and scraping with appropriate instruments. The former should never be resorted to, as the chemical action of the acid does not stop with the decomposition of the calcareous deposit, but by the same affinity attacks the tooth itself, and with almost equal readiness destroys it. The removal of tartar by the second method does not involve a very great amount of skill, and with suitable instruments is easily performed. To accomplish the operation with success, appliances and instruments of various forms and curves are necessary, adapted and adjusted to the various situations to be operated on. All instruments should be very sharp; but, in my opinion, with the cutting edge slightly removed. The blade of the instrument should be applied at a slight obtuse angle with the tooth, beyond the edge of the deposite next to the gum, and passing under the tartar thus scale it off to the point of the tooth, in such a manner as not to roughen or in any

manner abrade the enamel. Tartar which is deposited on proximal surfaces of the teeth is to be carefully noticed and removed with instruments having very thin blades. After the thick deposits have been removed the surface should then be carefully and gently scraped, so as to thoroughly clean off every particle of the tartar, and afterwards fully and completely polished with fine pumice or arkansas stone, and finished by burnishing. The manipulation of removing tartar is one of the most simple in dental practice, but to be successful in this, as in every other operation, the process should in every instance be performed with the most perfect thoroughness, as neglect or carelessness on the part of the operator will cause a new deposit on a rough surface with great rapidity. In fact a careless operation will often leave the mouth in a worse condition than before the teeth were operated on.

The removal of salivary calculus is perhaps the most unpleasant duty the Dentist is called upon to perform, as the majority of the cases which require it are very disagreeable, and many are positively disgusting. The popular mind seems to be lamentably ignorant on the subject of proper care of the teeth; and it should ever be the duty of the Dentist to inform his patients of the importance of cleanliness, as many are very prone to neglect the matter, either on account of the unpleasantness of the operation, or from ignorance of the necessity of it.

The eradication of *Green* or *Brown Stains* requires some practice—judgement, and a more skilful manipulation than the removal of salivary deposits. As this disease presents itself in three distinct stages I shall speak of the remedies suitable to each one.

Stage I. Where the erosion is but slight, friction with a piece of hard and fine grained wood (such as orange wood) combined with fine pulverized pumice stone, will be found sufficient to correct this evil. The principal seat of the stain being on the neck of the tooth and in close approximation with the free margin of the gum, care should, in

every instance, be taken not to wound the soft tissue, such accident, although of no material consequences will have great influence upon the patient. In most cases the operation will ever afterwards be dreaded and most certainly will they complain of the roughness or the unskillfulness of the operator.

STAGE II. The disease having made great progress we will not only find the enamel discolored to a greater extent, but will also find that the disease has carried its ravages to a great depth. In most cases the dentine will be more or less involved; this being the case the tooth, as a general rule, is extremely sensitive to the touch. The disease presenting itself as above described, the enamel chisel and file will be the most appropriate instruments to perform the operation. The chisel, the first instrument brought into service, should be of fine quality, of excellent temper, decided sharpness and well adapted to the surface to be operated on. And here I wish to remark, that all of the above qualities are combined in the instruments known as Dr. B. F. Arrington's enamel chisels. These instruments may be approximated but not surpassed.

Grasping the chisel firmly, and in such a manner as to leave the thumb independent of the movements of the hand, this (the thumb) should rest on a neighboring tooth, in order that the operator may have perfect control over his instrument and avoid the slipping of the same, by which accident the soft tissue would be wounded. This precaution observed, the operator will proceed with a steady and decided movement of his hand, cutting from the edge of the tooth towards the gum, and thus separate the diseased from the healthy tissue.

In all cases the operation will be painful, but in many intolerable; for such, the writer has applied nit. argent (chrystalized) by slightly touching the sensitive dentine, and with the most happy results.

The chisel following each application of the caustic, the diseased tissue will be removed without much inconvenience

to the patient, and before the caustic has time to discolor the dentine.

As a precaution against discoloration, it is advisable to apply a neutralizing agent, such as common salt.

By using the chisel carefully the use of file may be omitted, and I prefer to dispense with this latter instrument as the friction produced by it gives unnecessary pain, and does not aid any in the speedy accomplishment of the operation. Having thoroughly removed the diseased tissue the surface is now ready for final finishing, the process being the same as already described in the removal of salivary deposits. Of course, the above treatment is only advisable where the dentine is well calcified and of sufficient thickness to protect the pulp.

STAGE III. In this stage of the disease the dissolution of the dentine will be in very close approximation with the pulp, and in many instances this organ will be found exposed. The treatment applied in the second stage is here not admissible, and should therefor not be attempted, as it would remove too much of the healthy tissue to leave sufficient protection for the vital part, saying nothing of the disfigurement and the weak condition in which the tooth would be left. Under these circumstances our only treatment is to form a cavity of proper shape and to fill accordingly.

In the treatment of the teeth, as with all other diseases physical or moral, there is much truth in the old maxim—"an ounce of prevention is better than a pound of cure." The most potent of all preventives of diseases of the teeth and mouth is cleanliness. Therefore, the dentist should avail himself of every opportunity and neglect no means of impressing upon the minds of his patients their duty in this respect.

Local treatment will many times prove insufficient, even in cases which are not complicated with constitutional diseases, as syphilis, scrofula and the like, therefore every dentist should qualify himself to administer this treatment

in his own person, rather than refer his patient to the practitioner of medicine.

This is an imperative duty if we would uphold and support the true dignity of our profession, and demonstrate to the world the validity of our claim to be considered members of an alleviating and healing profession.

ARTICLE IV.

Disease of the Antrum.

J. H. M., of Surry Co., North Carolina, sent us, a few weeks ago, the following history of his own case:

"In 1859. I experienced severe toothache in the left superior 1st bicuspid, followed by swelling. In about a month suppuration occurred, and the pus was discharged through the left nostril, and has continued to run, with short intermission until the present time.

I have no acute pain, but there appears to be a fullness and a dull aching on the side of the left nostril, which appears to be the seat of the disease, most of the time. In the morning the matter appears to run into my throat and mouth, and smells very offensive; in fact, this is the case all the time.

My general health is not good; I am very nervous, with constant weakness in the back; and although my appetite is good, I am considerably emaciated, yet able to do light work in good weather.

In 1864 a Dentist extracted all the teeth on the affected side back of the eye-tooth, and punctured the antrum from the socket of the first molar without any beneficial effect. The soreness is mostly above the eye tooth, which tooth has always been somewhat sore, so much so as to lead me to suspect it is diseased about the end of the root.

I have been treated by physicians with iodine, &c., without effect. They say I have neuralgia also, but think it originates mostly from the antrum."

We advised, in the first place, the removal of the affected

cuspid tooth, believing it necessary to get rid of all irritants, and to determine, by probing, whether an opening existed from the cavity of this tooth into the antrum. If no such communication was discovered, then to perforate the bone above the point formerly occupied by the palatine root of the first molar on the affected side, and use as injections, either Lugol's solution, or the permanganate of potash; to inhale iodine once or twice a day, and paint the affected side of nostril and part of face with tincture of iodine; internally to use iodide of iron, iodide of potass, and cod liver oil, taking this prescription three times a day; also to use the bitter tonic tincture of gentian half an hour before each meal.

SELECTED ARTICLES.

ARTICLE V.

Heavy Foils.

By Henry S. Chase, M. D., D. D. S.

The number of dentists who use the heavy foils is rapidly increasing. Dr. Atkinson, of New York, deserves the thanks of the profession for bringing them again to its notice.

Dr. Arthur, of Philadelphia, many years ago advocated the use of Nos. 10 to 15. That was before mallet pressure was known. Foils as heavy as 30, 50 and 120 could not easily be manipulated by hand pressure, and one cannot go much higher than Nos. 10 or 15, even with a single thickness of a leaf, by hand pressure alone.

When new fashions are introduced many persons go to an extreme which is ridiculous; and so in the use of the heavy gold there is danger of going to an extreme which is neither desirable nor useful, but on the contrary injurious.

Undoubtedly two pure gold plates of No. 20 of the guage could be welded together by serrated instruments and sufficient mallet force.

Now the thickness of our gold foils must be adapted to the strength and condition of the tooth which we are to plug.

A certain amount of mallet force will cause pericemental inflammation in one tooth, which would be perfectly indifferent to another tooth. The enamel which would remain intact from any number of blows of a definite weight, from the mallet, in impacting a gold plug, would crack in one or more places by *increase* in the *weight* of blows, given to the gold alone. We have all seen cracks occur in the enamel from concussion produced by blows from the mallet.

The force which is given by a mallet to a plugger, placed on the mass of a gold plug, is diffused throughout the whole substance of the plug, and also every portion of the crown and root, and even to the maxilla itself. Now this concussion produces cracks in the enamel which are injurious to the integrity and durability of the tooth. Therefore the blow should be brought down to that degree of weight which the dentine is able to bear with impunity.

The smaller the mass of gold under the plugger the less force is required for welding. Therefore, the smaller the point of the plugger the lighter may be the blow to produce the desired effect.

To ensure the welding of 120 gold foil, without *too great concussion*, we must use pluggers with very small points. Those measuring No. 20 of the guage plate are as *large* as should be used for No. 120 foil. Smaller ones than these must be more generally used, especially in those places where great strength of plug is required, and the greatest perfection of welding desirable.

For the *margins* of *approximal* cavities, I prefer No. 30 foil, and also for delicate margins on the crowns of bicuspids. The approximal cavities in the incisors, I think, are also easier plugged with Nos. 20 or 30, than with 60 or 120. The undercuts that must be plugged by hand pressure, are also best filled with No. 20.

Nos. 60 and 120 are best manipulated by being cut into small squares, not so wide as the diameter of the cavity ? or by oblong squares, three times as long as wide. They may be consolidated best, by laying them flat and using one or

two thicknesses at a time, for impaction. In moderately large cavities, having heavy walls, they may be placed flatways, or edgeways, indifferently. Against the perpendicular walls, it is best to let a small portion of the flat side lie, and with a foot-shaped instrument impact it against the wall at an acute angle.

Nos. 20 or 30 can be used in most cavities, without reference to the position of the strips. I cut these numbers into strips, from a half inch to an inch in length, and from one-sixteenth to one-eighth of an inch wide. But a more even surface can be kept by *folding* any of the heavy numbers upon themselves flatways.

When the surface of the cavity is nearly approached, a more satisfactory plug will be made by always laying the strips flat. Minute depressions are thus avoided in the face of the plug when it is polished.

Have I abandoned No. 2 gold foil? No. There is hardly a day that I do not use it in connection with the heavy foils. I use No. 2 in situations where *strength* of plug is not required, and when density is not desirable. Strength would not be required in the bottom of a *simple* crown cavity, even if very large. Density is not desirable next to a nearly exposed pulp. A plug of a given size will weigh more if made of No. 60 gold, than of No. 2. The greatest possible solidity in a plug is not *always* desirable. The nearer we can approach to the density of the dentine itself, and at the same time, ensure strength and the exclusion of fluids, the better. —*Missouri Dental Journal.*

ARTICLE VI.

Mercury in India Rubber Dental Plates.

G. H. Perine. D. D. S.

Writes as follows to the Editor of *Medical Gazette*.

In the *Medical Gazette* of 22nd January is mentioned an important operation by Dr. Whitehead, of this city, and the mechanical substitution of the parts by Dr. Crane. The question is raised of the possible noxious effects of mercury

from india-rubber dental plates; and as you ask the views of those having experience in the matter, I would present the following facts:

It has been now some fifteen years since this substance was first offered to the dental profession as a suitable base for artificial teeth.

For the first five or six years, it was but little employed by our best dentists, they having little confidence in its durability. It, however, slowly worked itself into favor with the profession and the public, until at the present time, eight-tenths, and probably a larger per cent. of all the artificial dentures made are mounted upon this base.

In the year 1863, it was estimated by Dr. B. W. Franklin, an eminent mechanical dentist of this city, from data kept by him and obtained from the manufacturers of porcelain teeth, and from the sale of dental rubber and materials, (in which he was then engaged,) that no less than one hundred thousand sets of artificial teeth were made upon vulcanite in the United States in that year. Since that time, its employment by the profession has become general, and the number of dentures on this base that are now being satisfactorily used, is inconceivably large. These facts are mentioned as arguments against the idea of any extensive injury resulting from the employment of this substance as a base for artificial teeth Pure vermilion, pure sulphur and properly prepared rubber (when carefully vulcanized), ought to be inert when placed in contact with living tissues. There is no acid known, which, when diluted to the strength of oral secretions in health or disease, acts upon vulcanite. Concentrated potash, chlorine, ammonia, and many active agents, have no action upon this substance. That some persons are more or less affected with hypertrophied conditions under all dental plates, is a fact cognizable by every practitioner of experience and observation; but that the vermilion in vulcanite dental plates has an agency in producing any extra unpleasant effects in any case coming under our own observation, we do not believe. It is true that much

of the vermilion and sulphur of commerce are adulterated, and contaminated by poisonous substances, arsenic, red lead, oxide of zinc, and other substances.

Much of the dental rubber offered in the market, and used by some dentists, is compounded by parties having little if any knowledge of these adulterations. And yet notwithstanding this, tens of thousands of sets of teeth are annually made on vulcanite, and worn constantly, giving the utmost comfort and satisfaction. These teeth are in the mouths of patients of every grade of society, and in every possible physical condition. We were among the first to adopt this (then) new base; we have watched its progress with interest, and have noted its effects; and we do not believe there has been a single case presenting itself anywhere, showing well defined evidence of the medicinal action of mercury.

That metallic mercury is present in the vulcanite rubber plate, can be demonstrated by burning a piece and collecting the products of combustion on glass or porcelain and rubbing the burnt mass on polished brass; the surface becomes immediately whitened. But the small amount of metallic mercury, or any reasonable amount of foreign or even poisonous matter with which the vermilion, or the sulphur, would be likely to be contaminated, could not exert their specific effects when enveloped in the insoluble vulcanite plate.

There are some persons so constituted that they cannot tolerate the constant presence of foreign substances in the mouth, without more or or less inconvenience; others present a constitutional predisposition to tumefaction of the mucous surfaces, rendering the wearing of any plate difficult, if not inadmissible. The superior adaptation of the vulcanite to the parts upon which the denture rests, especially with large air chambers, the plate being a poor conductor, is more liable to scald the parts, causing all the noxious results charged to the vermilion in the vulcanite plate. When we take into consideration the imperfect and crude manner in which artificial teeth are made, the little skill employed in their

construction, the want of harmony in form and expression given, and the total absence of adaptibility in every essential requirement, the better part of the profession and the entire public ought to be thankful that so little permanent injury results. When the time shall come that the public will learn to discriminate between meritorious and skillful experience, and pretending, incompetent ignorance, both in the medical and dental professions, many of the evils now complained of will be traceable to legitimate causes, and find speedy and permanent relief.

ARTICLE VII.

Two Cases of Convulsions During Dentition Arrested by Scarification of the Gums.

By G. Stevenson Smith, L. R. C. S. E.

Since Dr. Cairns communicated his able paper on the Scarification of the Gums to this Society, I have chanced to meet with two cases of convulsions in young children, in whom the violent and alarming excitement of the nervous system was completely allayed by lancing the gums.

A. M., aged six months, a sickly-looking infant, had not been well for a day or two, and when I was asked to see him he had much heat of skin and of the head, and had vomited several times. The pulse was sharp and quick, and for twenty-four hours there had been numerous successive attacks of general convulsions. Failing to find any cause for the fits in the state of the general health, I examined the mouth, and found the lower gum red, tumid, and glistening. I divided its tense margin with a lancet, and the little patient appeared to get immediate relief. At my visit next day, I found him lively and contented, the temperature had fallen, the gastric irritation had subsided, and there had been no more convulsions.

L. S.; aged eight months, had been fretting much for some days, was hot and restless at night, had a burning head, quick pulse, and a ceaseless whining cry. I found that he had

repeated attacks of convulsions, and when I arrived he was in a state of opisthotonos, this condition having existed for several hours. Having carefully examined the child, I found nothing to acconnt for the nervous symptoms, save that the upper gum was hot, red, and swollen. He had cut the two lower incisors. I drew the point of a lancet across the tumid gum, and next day I found that the opisthotonos had passed away very soon after the operation. There were no more fits, and the child was comparatively well. The two upper incisors made their appearance in two days, and when I saw the child the other day hc was in perfect health.

Similar cases I have frequently met with before, and the members of the Society must have had the same experience

In Dr. Cairn's paper three questions were put, which I shall now endeavour to answer *seriatim.*

1st, Does sacrification do any good? Does it relieve local pain or prevent and arrest convulsions, laryngismus stridulus, diarrhœa, etc.? To this I reply in the affirmative. It does relieve local pain in many a case, and how this can be doubted for a moment I am at a loss to understand. The little patient cannot speak, says Dr. Cairns, and how can you be sure that you have given relief? It seems to me that, if we cannot interpret the feelings of a little child because it has not yet acquired the use of articulate speech, we are not well fitted to treat the diseases incident to infancy, and have yet to cultivate a most important part of our professional education. The simple wagging of a dog's tail conveys to his master a clear and distinct expression of the feelings whitch animate his canine breast ;and do not the calm repose, the sparkling eye, the joyful crowing of our little patients manifest their relief from suffering as decidedly as the sleeplessness, the fretfulness, and the shrill cry of pain tell of discomfort and distress? But Dr. Cairns does not believe that by abstracting blood from an inflamed part you can in the least degree either reduce or modify the inflammation. The part, he says, continues to be as red, as hot, and as painful as before. Such ideas are only to be explained

on the supposition that our friend never practices local depletion, and is consequently a stranger to the beneficial effects of such a remedy. Has he never seen relief following the opening of an abscess, or the application of leeches to a swelled testicle or to the belly in a case of acute peritonitis? If he has not, then I can easily comprehend why he doubts that the abstraction of a little blood from a congested gum can alleviate pain.

That scarification may prevent and arrest convulsions I firmly believe, and in this opinion I know that I am supported by a perfect cloud of witnesses. Dr. Brown-Sequard has shown how easy it is by pinching or otherwise irritating certain nervous filaments in the guinea-pig to induce convulsions; and I think one can without difficulty understand how irritation of the branches of the fifth pair may produce convulsions in infants whose nervous system is so susceptible of impressions That the convulsions in my two cases were caused in this way, and that they were arrested by relieving the congested gums, I have not the faintest shadow of a doubt. Dr. Cairns may say that the cessation of the attacks following upon scarification was a mere matter of coincidence and nothing more, and that the convulsions might have disappeared even suppose nothing had been done. This I do not deny; but I am inclined to think that, instead of ceasing spontaneously, there was a much greater probability that they would have continued. Besides, this is not, in my opinion, the proper spirit in which one should discuss the influence of any remedial measure. The progress of medical and all other science is no doubt furthered by a certain amount of wholesome scepticism, but surely it must be retarded if we doubt everything and believe nothing. As was well remarked by Dr. James Young, in a previous discussion on this subject—"I do not consider myself a heroic practitioner in any sense of the term, but at the same time I have no sympathy with those who stand idly by when something ought to be done. There is a great deal of truth and a spice of grim humour in the remark of one of the

fathers of medicine, that the expectant treatment of disease is "a meditation upon death." And I think it is highly culpable to refuse to perform so trifling an operation as scarification of the gums when we are convinced that it is in them that the source of the irritation resides.

Dr. Cairn's second question was, Does scarification do any harm? To this I reply that, so far as my experience goes, it does not. Indiscriminate lancing of the gums cannot but be productive of mischief, but in properly selected cases I believe the operation is never followed by any evil consequences. That it may occasionly lead to fatal hæmorrhage I cannot deny; but such cases are extremely rare, and can only be regarded as accidents, against which it is almost impossible to provide. The extraction of a tooth may lead to death in the same way, but no one should on that account denounce the operation as an unjustifiable one. Besides, as Dr. Ritchie suggested, the existance of the hæmorrhagic diathesis might be ascertained by inquiry as to the history of the vaccination.

Dr. Cairns third question was, Is scarification in the circumstances warrantable? He thinks it is not, because it inflicts unnecesary pain, superinduces some of those conditions which it professes to remedy, and, at the best, is a mere experiment. In regard to the first mentioned reasons, I have nothing further to say than merely to repeat what I have stated already, that in properly selected cases no such objection can be for a moment entertained. But he says scarification is at the best an experiment. Now, by an experiment I understand something that is done in order to discover an uncertain or unknown effect. But the effect of scarification is neither unknown nor uncertain, and therefore scarification cannot properly be called an experiment.

We know positively that irritation of a nerve trunk may induce convulsions, and in dentition how very often do we find the trifacial excited by inflammation of the gum. The lancing relieves congestion, tension, and pain, and by allaying irritation prevents or arrests convulsions. Such, at all

events, is my belief—a belief which the experience of my seniors tends to strengthen and confirm.—*Edinburg Journal Canada Medical Journal.*

ARTICLE VIII.

Interdental Splints for Fractures of Inferior Maxilla.

By Dr. Geo. L. Fitch, Dentist.

Interdental splints in various forms have been used for many years, but owing to their complexity or to the difficulty that any one but a skilled mechanic would find in manufacturing or applying them, their use has been limited. Undoubtedly the best of these appliances has been the vulcanite splint used of late years, but the objection to this is, that none but a dentist could apply it, and but few dentists would be able or willing to take the responsibility of treatment in these cases.

Prof. F. H. Hamilton, M.D., many years ago proposed the use of gutta percha, a wedge shaped piece of this material being softened in warm water and placed between the molar teeth on each side, and then moulded around the crowns of these teeth with the fingers, while a bandage around the chin and over the head completed the dressing. The jaws being held apart, by the gutta percha, food could be introduced between the front teeth. Other surgeons have followed in his track with the use of gutta percha, but the jaw, with all the different plans, was held firmly in one position.

The advantage which vulcanite splints have had, is in allowing the patient the use of the jaw while the broken fragments are still held firmly in apposition; their disadvantage, as stated above, the difficulty of applying them. I have recently succeeded in applying gutta percha to the same use as vulcanite, and a brief description will, I trust, put interdental splints into the hands of every man in the profession. Take a piece of dental gutta percha of length sufficient to reach around the dental arch as far back as the second molars

on either side, and of width sufficient to reach one or two lines below the crowns of the teeth, resting on the gums when it shall have been moulded to its place. As this variety of gutta percha comes in thin sheets, two thicknesses may be used, a little heat and pressure with the fingers converts them into one. Now the broken fragments being held properly in place by an assistant, dip the gutta percha into water heated to a little below the boiling point, and while it is softened by the heat, mould it gently around the teeth and gums: as it hardens quickly, possibly it may have to be dipped the second time in the hot water before it can be nicely and smoothly adjusted. Allow it to remain in its place a moment or two, and then withdraw it and dip in cold water, and if there be any superfluous portions they may be clipped off with the knife or scissors. Next take two pieces of iron wire, a little less than ordinary telegraph wire in size, (and these should be previously prepared) and bend them into the shape of a horse shoe, or more like the letter V, with its angle cut off somewhat. Flatten out one end of this wire until it is about two thirds as wide as the splint where it goes over the molar teeth; heat this flattened portion a little and lay it on the gutta percha; the flattened portion should extend as far as the end of the splint and as far forward as the angle of the mouth, through which it should protrude, and then bend backwards on a line with the outside of the cheek, and make it (the wire) as long on the outside of the mouth as on the inside. The wire being somewhat heated will readily press its way a little into the splint, and with a thin piece of gutta percha placed over it and smoothly plastered down, our design is completed. The wire outside of the mouth may be bent into different shapes so as to be more readily fastened to the piece of leather or pasteboard which goes under the chin. This latter piece in this, as in the vulcanite splint, being made to fit the under surface of the jaw, and securely fastened to the wire on either side. If I have succeeded in making my description plain, I think any surgeon could in this manner easily construct an inter-

dental splint equal in every respect to vulcanite, and at an expense not to exceed twenty-five cents. The gutta percha exerts no deleterious influence in the mouth any more than vulcanite does, and it may be taken out and washed frequently to insure cleanliness. Dental gutta percha may be had at any dental depot, and of the majority of dentists throughout the land.—*Medical Gazette.*

ARTICLE IX.

The Inter-dependence of Diseases of the Teeth and of the Female Pelvic Organs.

By N. W. Hawes, Boston.

Demonstrator of Operative Dentistry in Harvard University.

The reflex influence produced by diseased teeth opens a subject so patent to the Medical and Dental professions, that I feel my inability to inspire new thought upon the universally accepted fact, that disease in an organ may and does excite sympathy in contiguous or remote parts of the physical apparatus. Though the teeth are classed among the "superflous organs," yet in their disease it has been shown that they exert a vital influence upon the whole living system. Among the affections enumerated by Dr. Fitch, in one of his dental works, as occasioned by diseased teeth, are phthisis pulmonalis, dyspepsia, inflammation of the eyes, epilepsy, hysteria, hypochondriasis, rheumatic affections, tic doloreux, etc.; and he asks, in speaking of alarming diseases as being produced by slight causes, "It is unfair, or unreasonable, to suppose that a diseased state of the teeth, or their being in a state of putrefaction and constant irritation and inflammation, should at times produce the most fatal diseases in the general system?"

Now, it is not necessary that they should be in a state of putrefaction to engender diseased influence. I at one time called upon a medical friend suffering from neuralgia, as he said, and remarking that he "was sorely afflicted at times," and had exhausted the whole list of anodynes, and found

but temporary relief. I questioned him in regard to his teeth, eliciting the reply, that they were "sound as a nut, every one of them." On my persisting, he suffered me to make an examination, which resulted in the discovery of a left superior bicuspid root entirely covered by a healthy appearing gum. This root was not purulent, or even unhealthy to the eye, but its removal put an end to his neuralgic sufferings, and fully converted him to belief in reflex influences of the teeth. Neither is it necessary that the teeth should be painful, to create disease. Is it uncommon for painless tumours to occasion death; or for foreign and effete matter to produce the same result, even when entirely unsuspected as the cause, until this is developed by autopsy? I could relate several cases where marked and immediate improvement in health has followed the removal of diseased teeth, whose influence has not been suspected. I will cite but one instance. About seven years ago, a lady called upon me for advice respecting her teeth. She had suffered long from dyspepsia, had a hacking cough and hectic fever, was exceedingly nervous, and of course somewhat emaciated. There was not a sound tooth to be found; her gums were inflamed and putrid, with pus exuding from around nearly all her teeth. I at once advised their removal, and the adjustment of an artificial set. She questioned the propriety of going to the expense, inasmuch as her health was so precarious that she did not expect to live long. I dwelt upon the probability of an improvement in the general health after release from her teeth, and finally persuaded her to submit to the operation. The next day she came in and allowed me to extract her teeth,—twenty-eight in all—without anæsthesia, and thus remove the cause of all her infirmities, as was subsequently demonstrated by her speedy return to health. I saw her a few days ago, and she said she had "not been sick a day since I took her teeth away."

Who can doubt the pernicious and even fatal effect of the masses of disease that exist in some mouths, when we consider their contaminating influence over twenty thousand

inspirations every twenty-four hours, of heaven's purifier to life itself, the blood, or the numerous nervous disorders that arise from the teeth, too often the primary cause? Is it not startling that the medical profession pay so little attention to the teeth, when they consider that the dental nerves are derived from those usually denominated the superior and inferior maxillary, which are the second and third branches of the fifth pair? Do we not at once perceive the intimate connection between the teeth and the whole body? But I will not extend these remarks. It seems but necessary to call attention to the fact, and it will of itself excite prolific thought.

In reversing the problem, with a few cursory inferences from gynæcology, with regard to the reflex influence produced upon the teeth by an unhealthy uterus, I call to mind the expression of some writer, that every child costs its mother a tooth. Now, whether this trite saying be true or not, I know a mother whose teeth were pronounced past saving by a dentist over twenty years ago; she ceased child-bearing, passed the turn of life, and subsequently I filled her teeth, with the firm conviction that my labor was not lost. My impression is that the uterus plays a more important part in the defection of the female teeth than is generally conceded. Dr. Hall says, "there is scarcely a solid texture or fluid that is not altered from its healthy condition by amenorrhœa." Now, anything that would deplete the blood, or give rise to an unhealthy and vitiated secretion of the fluids of the mouth, must exert a deleterious effect upon the teeth, either by producing inflammation of the gums, or by making direct aggression upon the teeth themselves; and, as the female teeth suffer most, we must hold the uterus responsible for part, at least, of these influences upon them.

After operating, some time since, for a lady, I flattered her with the remark that her teeth were much better than the average. A few months afterwards she called upon me looking rather anæmic. An examination revealed a sad condition of her teeth,—her gums were swollen, turgid, and

bleeding at the slightest touch, and her teeth badly decayed particularly at the margin of the gums. I confessed my inability to understand the condition, but inquiry from her husband revealed the fact of a miscarriage, and to this I attributed the erosion of her teeth. Was not my inference correct? Erosion of the teeth is obviously the result of the corrosive menstrua that come into contact with them,—the acid principle being the active agent generally, if not always. I knew a lady, who died from cancer of the uterus, whose teeth during the last few weeks of her life were literally washed away. Now, what caused this abundant secretion of acid, if not the diseased uterus? Would there have been the same secretion had the disease been elsewhere situated? Is not the uterus, when diseased, prone to produce a condition of things favorable for the destruction of the teeth? And is not the uterus in a condition to exert a depraved influence upon the fluids during nearly two months in the year, conforming to the menstrual periods? Does not the offspring of a mother, suffering from any of the innumerable diseases of the pelvic organs, inherit an imperfect general organization, to hand down even to the third and fourth generation? I suppose that a child properly brought into existence, and endowed with an unimpaired vital fluid, might live on like Methuselah, and perhaps forget to die, unless by accident, or another flood. Some one has said that the original impartation of life is from the father, but the development depends upon the mother; and if she be healthy and robust, the child will be so, too, almost regardless of the father's physique. Certainly we know that the child inherits a good or bad set of teeth from the maternal, rather than the paternal parent, and that the teeth are much affected, even where a wet nurse is employed, in conformity with the condition of her teeth. To end this digression, I am one of those who do not consider that the organs of reproduction were ever designed for a source of amusement merely, but for the specific object of replenishing the earth; and I sincerely believe that their abuse is the primary cause of a

great part of the disease, contracted or inherited, to which flesh is heir. Would that some competent hand would properly treat this subject for the good of a common humanity! It might disgust a Paul, or shock a Joseph; but let the one exempt from the sins referred to cast the first stone.—*Gynæcological Journal.*

ARTICLE X.

Morgan's Plastic Gold.

At a late meeting of the Buffalo City Dental Association, the subject of "Filling approximal cavities in bicuspids" came up for discussion. The debate was one of considerable interest to those present, but did not present originality enough to be worthy of a full report. One point, perhaps, however, may be of interest to some of our readers. We refer to the practicability of anchoring the gold in the cavity without using retaining points. This can be done by the use of Morgan's Plastic Gold. Other Sponge Golds may answer the same purpose, but in the hands of the writer, the Plastic Gold has been more manageable than other kinds. If the floor of the cavity is covered with this gold, freshly annealed, and it is then thoroughly condensed, making the pressure directly perpendicular to the floor of the cavity, it can be carried down and anchored, so that further additions of gold can be made without danger of causing any "rocking" or dislodgment. In condensation, the plugger will appear to carry down just what gold is before it, without dragging or disturbing the surrounding mass, and the gold will cohere to the slightly roughened dentine sufficiently to retain its place. The writer uses the Automatic Plugger thoroughly upon the first layer, and then proceeds to build up the remainder of the filling with foil. One point further requires attention. In approximal cavities, the Plastic Gold should not be permitted to approach the edge of the cavity at any point, especially not at the cervical wall. Many fillings excellent in all other respects, have proved defective

from this cause, as experience has shown that the entire part of the filling which it is essential should form a water-tight joint, should be made of foil. The *Dental Times* for January, 1868, contains a report on Plastic Gold, read before the Pennsylvania Association of Dental Surgeons, which explains the reason of this precaution. The whole report is well worthy of study, but from our limited space, we can only append a few extracts. Fillings of both Plastic Gold and Foil were made in a block of steel, so arranged as to allow of the easy removal of the plug, and were examined under the microscope.

"A filling of Lamm's Gold was carefully packed by a member of the committee, who spent much time in endeavoring to secure a perfect filling. The microscopical examination of this filling exhibited an an external surface equally as good as foil. The periphery of the filling, at the edge of the cavity, was equally perfect with the center, the crystalline structure being entirely removed. This, how ever, the operator reports was not attained without a large expenditure of time. The gold at the bottom of the cavity did not present the compact structure that the foil filling exhibited, made under similar circumstances and in the same cavity, the crystals being almost as prominent as in unworked gold."

Among the conclusions arrived at were:

"That if sufficient labor be bestowed upon Plastic Gold, a surface equal to the gold foil can be made. But this can only be accomplished at the periphery of the filling by an amount of labor largely in excess of that required foil in similar positions."

These experiments were conducted by as good operators as there are in the country, and the results are worthy of the attention and acceptance of the dentist. A few dentists of superior ability, have used sponge gold exclusively, and have made for themselves a well deserved reputation for the excellence of their operations. Indeed, attention was first generally called to the building up and restoration of the

shape of the teeth, by the use of sponge gold; but while a few have achieved success, the greater number of those who have attempted its use have abandoned it, and again taken up the use of foil. But while Plastic Gold may be regarded as inferior to foil as a material for fillng teeth, it will be found invaluable for overlaying the floor of the cavity, if dentists will become habituated to its use for that purpose. To obtain entirely satisfactory results, enough of it must be used to make its properties fully understood, but when this point is reached, the dentist will find one of his most tedious and vexatious obstacles removed.

It should first be used in crown cavities, until some degree of dexterity is acquired in the manipulation of the gold, and afterwards in places more difficult. The proper precautions should be taken to ensure dryness of the cavity. *Good* fillings cannot be made unless this point is fully appreciated and attended to.—*Dental Advertiser.*

MONTHLY SUMMARY.

Carbolic Acid.—As a therapeutic agent, it has been most extensively used as an external application.

In sloughing wounds, a solution composed of one part acid to forty parts of water produces the most marvelous effects: it destroys all fetor, facilitates the separation of the slough, and causes parts beneath to assume a healthy appearance. It seems, also, to have the effect of promoting the growth of healthy granulations, and of hastening the healing process of wounds. It has been used successfully in several forms of skin diseases, *viz.*, lepra, tinea capitis, rupia, and eczema. It has proved a valuable agent in the treatment of hemorrhoidal affections and in fistula It is a valuable caustic, it only affecting a superficial layer of the tissue to which it is applied, hence its use would be indicated in diptheria and malignant sore throat. But carbolic acid has also been used internally, with beneficial results. One drop, given in the form of a pill, has checked vomiting when other remedies had failed to produce any effect.

It has been highly recommended in cases of dyspepsia, accompanied with pain in the stomach after eating.

It also has been largely used by many eminent French physicians in the treatment of phthisis. A large number of patients in different stages have been treated, with the most favorable results. The mode of administration is as follows:—"Fifteen drops of pure acid is dissolved in ʒ ij. of spirits, and the solution mixed with ℥ xxxij. of water; this quantity is administered daily, partly by the stomach and partly by the inhalation of fluids in a pulverized form."

Owing to the great demand for carbolic acid, it is largely adulterated. The article most commonly used for this purpose is coal-tar oil, but it can be easily detected·

Pure cabolic acid is soluble in from 20 to 60 parts of water, or twice its bulk of solution of caustic soda, while tar oil is nearly insoluble. Therefore, to test carbolic acid, we have only to put a drachm of it in a pint bottle, pour on it half a pint of warm water, and shake at intervals for half an hour, when the amount of oily matter will show the impurity. Or dissolve one part of caustic soda in ten parts of carbolic acid, the residue will show the amount of impurity.—*Dr. W. Little—Drug. Circ.*

A Tooth Driven into the Antrum.—A man was admitted to St. Mary's Hospital, who, three years and a half before, from a severe fall, had lost the right upper lateral incisor tooth, a few weeks after which an abscess formed, and discharged, both through the alveolus of the lost tooth, and through a small opening in the cheek. He had been treated by many naval surgeons, for what was supposed to be caries of the maxilla. The discharge from the alveolus had now ceased and the orifice healed over, but there was a constant profuse discharge from a sinus in the cheek, half an inch outside the nostrils, with considerable pain and swelling of the side of the face. On probing the sinus Mr Walton detected a smooth hard substance like tooth enamel, and after enlargening the opening, extracted with a forceps, in a perfect condition, the lost tooth, which was lying loose in the antrum. The pain and swelling subsided, the discharge ceased, and the wound soon healed.—*Med. Times & Gazette.*

Action of Nitrate of Silver on Nervous Tissue.—M. Grandry has communicated to the *Centralblatt*, the results of his observations on the action of nitrate of silver on nervous tissue. He used the tissue obtained from the frog and rabbit for his experiments, and placed portions of both from the centres and the nerves in a one-fourth per cent. solution, macerating them for five days in the dark, and then exposing them for three days to bright light. If the surface of the cord thus treated be carefully teazed out with needles, the axis-cylinders are found to exhibit a very regular and sharply-defined transverse striation—clear, unstained striæ, alternating with deeply-tinted ones. The breadth of the dark striæ varies from one to five thousandths of a millimetre, that of the clear, from one to three thousandths. In addition to the transverse striation, the axis-cylinder also exhibits a well-marked longitudinal striation, so that it presents a singularly close, though probably only superficial, analogy to a muscular fibre. Examination by polarized light, however, does not furnish any evidence of the existence of a doubly refractile substance. M. Grandry observed a similar transverse striation in the bodies of, and in the processes given off from, ganglion cells, especially in those of the anterior horn of the cervical portion of the spinal cord.—*Lancet.*

Neuralgia and its Treatment by Electrization.—In a paper contributed to the *Medical Record*, Drs. Rockwell and Beard give the results of their treatment of neuralgia by the Faradaic current. Of fifty cases, twenty-four recovered; eight approximately recovered; six were decidedly benefited; seven temporarily relieved; two not benefited, and three temporarily aggravated. Some of the cases were mild, but the majority had been vainly treated by medication. General electrization was employed in all cases, and is considered far preferable to the local application of the current. In some cases Faradaic electricity serves only to aggravate the pain; under such circumstances the galvanic current often proves serviceable. The instruments recommended are Dr. Jerome Kidder's, when Faradaization is desired, and Chester's air-tight galvanic apparatns, if the continuous current be preferable.—*Pacific Med. & Surg. Journal.*

Indication of Longevity.—H. P. Gatchell, M.D., Kenosha, Wis. (*The U. S. Medical and Surgical Journal*), reports a conversation with the late Dr. Beteley, of Cleveland, concerning the relation of the lobe of the ear, in which the latter informed Dr. G. that he had noticed in almost all old people, whom he had observed, long lobes to the ears.

Dr. Powell was accustomed to derive his indication of longevity from the angle subtended by a line drawn from the outer angle of the eye, through the orifice of the ear, and another drawn from the same point to the occipital tuberosity. But the angle in this case is determined by the depth of the occiput, and finds its explanation in Buchanan's doctrine of this region as that of animal force.

Dr. G. believes that the lobe of the ear is directly to the medulla oblongata, and only indirectly to the occiput. There is a general relation between the development of the occiput and the medulla.

The physician can assure the patient with long lobes, in the absence of malignant disease, of the probability of long life. He can also speak with more confidence in regard to recovery from either acute or chronic diseases, when the lobe is long than when it is short. Nor will he fail to observe that a large proportion of sickly people have a short lobe, or none at all.

Where a naturally strong constitution has suffered from excesses, the long lobe has become withered and wrinkled. And when one side of the brain, as indicated by a seated pain, has suffered more than the other, he will find the lobe of that side more withered than the other. Whatever tends to enfeeble the constitution, whether excessive toil, study, or venery, contributes to that change in the lobe.—*Med. Record.*

Green Line on the Gum from Copper Poisoning.—Dr. Donald Frazer (*Canada Journal of Dental Sciences*) records a case of poisoning from copper occurring in a sailor just returned from a long voyage. The green line on the gum was analogous to the blue line from lead poisoning, and was distinctly visible, having been received through the medium of lime-juice which had been left in a copper vessel.

Deaths from Chloroform.—During the year we have recorded in this journal twenty-five cases of death from chloroform. Commentary upon these figures is unnecessary. Remembering the comparatively insignificant number of alleged deaths from the inhalation of ether recorded since its introduction to the present time, and that there is not one of these "which cannot be explained on some other ground equally plausible" (Rep. of Ether Comm. of Bost. Soc. for Med. Improvement; Extracts from *Record*, vol iv., Supplement, p. 216)—a statement undoubtedly not true as regards chloroform—we must indorse Prof. Stille's remark (Mat. Med. and Therap., vol. ii. p. 115, 3d ed.) that "the surgeon who employs it [chloroform] assumes a responsibility of life and death for which neither his office nor the moral law afford him any license."—*Medical News and Library.*

Blackened Teeth from Tea.—We were lately consulted by a lady on account of discoloration of her teeth, which she supposed might be owing to some pills that we had prescribed for her. On investigation, the effect was traced to the tea used at the boarding house, which was kept from day to day in a tinned vessel, and heated up at meal-times, with the addition of a fresh supply of the material. The tin having worn off, left a surface of iron, and the infusion, in cooling, acted chemically on the iron, making a tannate or gallate of iron. The boarders had been regaling themselves on *ink!* We are told that this is quite a common custom at boarding houses and restaurants.—*Pacific Med. and Surg. Journal.*

Chloroform in Infantile Convulsions.—There is no speedier relief for these troublesome adjuncts to childhood than chloroform, given in doses from gtts. x to xxx in cold water, care being taken that the chloroform be intimately mingled with the liquid, as it forms at last but a mechanical mixture. It is also a very efficient remedy in cases of uncontrolable vomiting, or retching, caused by spasmodic action of the muscular coats of the stomach in adults.—*Oregon Med. & Surg. Reporter.*

BIBLIOGRAPHICAL NOTICES.

The Cell Doctrine. Its History and Present State. By James Tyson, M.D. Philadelphia: Lindsay & Blackiston, 1870.

This volume is inscribed to the Medical Class of the University of Pennsylvania, in which institution the author is Lecturer on Microscopy. This work is one which has long been desired by both medical and dental students, as it includes views which are only to be found in numerous and expensive works, and as collected in this small volume present a convenient form for study, &c. It is illustrated by a well executed colored plate of Dr. Beale's views, showing the production of formed material from germinal matter in epithelial cells, from section through layer of epithelium covering papillæ of frog's tongue; formation of pus, tendon, cartilage, muscle, elastic, tissue and nerve; amœba and nutrition of cell; and wood cuts illustrating the globular theory, cellular tissue, formation of nuclei and cells from molecules, diagram of the investment theory, formation of pus, development of cancer, connective tissue corpuscles, and formation of elastic tissue, with a copious bibliography. The work is published in a handsome form, in large type and on good paper.

EDITORIAL DEPARTMENT.

Special Dental Journals.—The following is from the "Gynæcological Journal of Boston," edited by Drs. Horatio G. Storer, Winslow Lewis and Geo. H. Bixby:

"In speaking, as we did in our last number, of special medical journals, we purposely deferred till the present moment all comment upon the periodical publications of a department, very important in itself, and which has hardly been appreciated as it should be by the general profession,—we mean Dentistry. Its interest, in its relations to gynæcology, was well pointed by Dr. Hawes in our January number. Dentists cannot always safely decide upon what is best for the jaws of a patient, if ignorant of her pelvic condition, and gynæcologists will often fall far short of a correct diagnosis concerning the causation of neuralgic pains and intestinal disturbance, if they fail to inspect the teeth, as they will of curing the affections coming within their own province, if they neglect to see that the mouth is kept in perfect order.

We take from our table three dental exchanges: the "Amerìtan Journal of Dental Science," edited by Dr. Gorgas, and published by Snowden & Cowman, of Baltimore; the "Dental Register," published by Messrs. Taft & Watt, of Cincinnati; and the "Canada Journal of Dental Science," edited by Drs. Chittenden, of Hamilton, and Beers, of Montreal. They are all

of them monthlies, are edited with judgement and care, and deserve undoubtedly a generous support. One is struck when examining these periodicals, by the general tone in favor of a conservative surgery. To remove a tooth, as to amputate a leg, is often far easier than to save the member; in both cases it is the most skilful operator who attempts, where it is possible, to preserve. This would hardly be imagined, however, when visiting a mart of artificial teeth, like that of Codman & Shurtleff, in this city where thousands and tens of thousands of clever counterfeits, almost improvements upon Nature herself, tempt those who would escape dyspepsia or regain the appearance of yonth.

To scientific attainments of no mean character, and to mechanical skill, the dentist of the present day must add a knowledge of general medical principles. He must not only be able to use, but to judiciously select, his instruments, often, indeed, himself to fashion them. Of the resources of his profession, one may judge from two books that lie before us: the so-called "Dental Catalogue" of S. S. White, of Philadelphia, elegantly bound and illustrated, and displaying a wonderful fertility of measures for producing comfort by torture, and the "Dental Materia Medica" published by the same firm, also very creditably prepared, and of very evident use,

In this connection, for it is as honorable to his profession as to the individual, we would mention the beautiful volume, entitled "Sanitary Institutions during the Austro-Prussian Conflict" sent us by its author, that eminent dentist, Dr. Thomas W. Evans, of Paris. Whatever the work to which a man devotes himself, if he do it well, he should be duly honored therefor, and though it fall to the lot of but few to become, as Dr. Evans, the titled attendant upon Emperors and an officer of the Legion of Honor, there is no dentist who cannot gain for himself respectful recognition by every medical practitioner, and by the community."

Anæsthetic Inhalation.—At a recent meeting of the Town Council of Edinburg, Scotland, the freedom of the City was presented to Sir, James Y. Simpson, Bart. M. D. on which occasion the Lord Provost in a speech made use of the following expression "I will not dwell on what yon have accomplished in medical science, I will only allude to your discovery,—the greatest of all discoveries in modern times,—the applicatiou of chloroform to the assuagement of human suffering."

To this Prof. J. Bigelow of Boston takes exception and in an article to the *Boston Med. & Surgical Journal*, says: "Sir. James Simpson, in a long and eloquent reply to the Lord Provost, while he complacently accepts the crown of borrowed plumes thus tendered to him, makes not the slightest allusion to the country from which they were plucked, in which country anæsthetic inha-

lation, with more agents than one, were established, vindicated, and successfully practiced long before it was heard of in Edinburg or any part of Europe." "The history of anæsthetic inhalation is well known. It began in this country, and was first used in the extraction of teeth, and afterwards in capital operations in the Massachusetts General Hospital, and in obstetrical practice. The attention of the civilized world was immediately drawn to the great American discovery."

Dr. Simpson replies to the letter of Dr. Bigelow by one sent to Prof. Elliot, of New York, for publication in the *N. Y. Med. Journal*, in which he says: "I have year after year heartily paid every due compliment to the most important part borne in the consummation of the practical application of anæsthetics by America, particularly by the cities of Hartford and Boston, and especially by the energy and genius of Dr. Morton. Surely, it would have been sadly out of place on such an occasion and with such an audience to have shown that, before I discovered the application of chloroform to anæsthetic purposes, numerous other agents had been previously suggested and used for the same object,—as sulphuric ether by Drs. Jackson, Morton, and Marcy—as carbonic acid by Dr. Hickman, in imitation of the experiments performed for ages on the poor dogs at the Grotto del Cani, and as nitrous oxide (an agent extensively employed as a dentist's anæsthetic at the present hour,) and which was first proposed some seventy years ago for "destroying physical pains during surgical operations" by Sir Humphrey Davy.

"In the way of a climax, you terminate one of the paragraphs in your letter with the statement that I was not the "first man" to inhale a vapor to such an extent as to destroy sensibility. Most certainly I was not, and certainly I never was so intensely foolish as to claim to be so. In the course of my investigation I have, however, experimented upon myself with various vapors, the innocuous or the poisonous effects of which upon the economy were previously altogether unknown and unascertained, and I have sometimes suffered in consequence. As a professor of therapeutics, you must surely be well aware that the first experiment of breathing a vapor to such an extent as to destroy sensibility was made neither in America nor in our own days. Withont adverting to the acknowledged fact that it was accomplished with the vapors driven off from hypnotic vegetable extracts by other surgeons, from Hugo de Lucca and Theodoric downward, let me remind you that Sir Humphrey Davy boldly (and notwithstanding that he had witnessed occasional deaths on animals from it) made the experiment to which you advert many times upon himself in the last year of the last century with nitrous oxide, and found that headache and other pains disappeared under its influence.

About forty years ago Faraday, in this country, and Godman in America, showed, as the result of their observations and experience, that the effects of the inhalation of the vapor of sulphuric ether were quite similar on the nervous system to those produced by the inhalation of the vapor of nitrous oxide gas—a truth subsequently proved by many pupils in many chemical and other schools in your country, as well as in mine, by their inhalation of ether. Your remarks, so far as I understand them, imply that it is your belief that Dr. Morton was the "first man" of "sufficient courage" to breathe "a vapor" so as to produce a state of anæsthesia. But you must know as well as I do, from the official documents laid before the senate of the United States, that this is doubtful as regards the course of matters even in America. For it appears on these documents—1. That Dr. Jackson avers that he breathed for this object sulphuric ether earlier than Dr. Morton. 2. That before Dr. Morton made the same experiment upon himself, in 1846, he made it first upon others, and particularly upon his pupil, Mr. Speirs; and 3. That two years previously, or in 1844. Dr Marcy, of Hartford, had successfully excised a tumor from a man who had been rendered anæsthetic for the purpose, by the vapor of sulphuric ether, while at that same early date, in the same city, Dr. Horace Wells had extracted teeth from a dozen or more patients rendered insensible by inhaling nitrous oxide according to Davy's suggestion.

There has lately been raised, I am told, in the city of Boston, a monument, in commemoration of the employment of anæsthesia in surgery in that city in 1846. But have the erectors of this monument cut upon it the names of either of your fellow-citizens, Dr. Morton or Dr. Jackson, as the first investigators, or the names of Warren and Hayward, as the first Boston hospital surgeons who operated upon patients under the influence of sulphuric ether? Or have they generously inscribed upon its sides any allusion to the fact that two years previously anæsthetics had been inhaled successfully in dentistry and surgery in the neighboring city of Hartford? I have been assured—though it is scarcely credible—that there does not appear upon the monument the name of a single American chemist, dentist, or surgeon. Why is it so? You have the monument. Have you not had the men?

Dr. Bigelow replies to this letter of Dr. Simpson in the *Boston Medical & Surgical Journal*, and closes as follows:

"Finally you allude to the monument erected in Boston by a public spirited individual, and which, among others, bears the following inscription. "To commemorate the discovery that the inhaling of ether causes insensibility to pain; first proved to the world at the Massachusetts General Hospital, in Boston, October, A. D. 1846." You inquire why no individual names were inscribed upon it. I reply, because it was intended only to com-

memorate the city of Boston as the birth-place of the discovery.

Mankind are not apt to forget their benefactors. They cheerfully unite in ovations and festivities given to distinguished men by "their friends and fellow citizens." But the suffering and now exempted world, will not forget the poor dentist, who amid poverty, privation and discouragement, matured, revealed and established the most beneficent discovery which has blessed humanity since the primeval days of Paradise."

Weston's Metal.—We have tested this metal in the case of entire lower sets and, are inclined to the belief that it is superior to anything of the kind which has yet been brought to the notice of the profession. We advise a trial of it by those who find objection to the lighter materials, such as rubber for example, or to the heavier materials such as the pure tin base; as it is claimed for this metal that a plate of it when finished need weigh no more than one of gold.

There is no doubt but that it is stronger, and will keep its color better in the mouth than any of the cast plates which have been in use, except perhaps aluminum, which can only be used in this way combined with an alloy of tin and silver to connect the teeth to the plate.

The following instructions are given for casting Weston's metal:

"Suppose the case to be a full Lower Plate of Gum Teeth,—those intended for Rubber are the only ones adapted to this work. Grind off the thin edges of the Gums(that part intended in Rubber work to be covered by the rim or band) to a right angle with the Labial and Buccal surfaces of the Teeth; the object of this as to prevent the Gum cracking by unequal expansion or contraction. Next upon a cast made of equal parts of Plaster of Paris and clean pulverized Soap Stone (Whiting, Pumice Stone, or clean fine Sand will answer as a substitute for Soap Stone), arrange the teeth in Wax, precisely as you would have them when finished. In grinding the joints' bring the body of the Gum squarely together, as closely as at the edges. Avoid using too much Wax.

When finishing with Wax, be sure to cover the pins well; and in arranging it for the rim, be careful not to let it overlap the Gum. By cutting away all superfluous Wax, and taking pains to make the Wax Plate perfectly smooth, much time and labor can be saved in polishing the piece after it is cast. The Plate now being ready for the Flask, invest the same as for Rubber, in equal parts of Plaster and fine clean Sand. The Flasks used for Rubber will answer, by cutting with a coarse half.round file an opening five eights of an inch in diameter, in the posterior part of the Flask for a gateway. Cut a smaller hole in the opposite side for a vent. When the Plaster in the Flask has set, warm

it before opening, so as to soften but not melt the Wax; open the Flask and remove as much of the Wax as possible without marring the Plaster. After doing this in the usual way, any Wax that remains must be carefully washed away by pouring boiling water into the Flask. Next cut a funnel-shaped Gate in the Plaster, through which to pour the Metal; this may be ¼ inch in diameter, where it opens in the Mould, directly posterior to the last Molars; the Vent to be one-half the size of the Gate and directly opposite it. Dry the Flask thoroughly from three to five hours, it must not be used till perfectly dry. Any moisture remaining in it can be easily detected by holding a mirror over the venthole. Now melt the Metal carefully in a clean iron ladle,—do not get it too hot; with the Flask heated so that it can barely he held in the hand, pour the Metal. When quite cooled, open the Flask and remove the Plate. If the piece is as it should be on coming out of the Flask, it will require little or no scraping or filing; use Sand Paper first; next Felt Wheels, and Pumice Stone; and finish with Felt Wheels, and the very finest Brush Wheels and Whiting.

These instructions, carefully followed are applicable to partial Upper and Lower Sets, Plain or Gum Teeth.

To replace a broken block, cut out the broken pieces and fit the block the same as for Rubber work; fill the dovetail with Wax: invest in Plaster and Sand; open the Flask; wash out the Wax; cut a Gate and a Vent; dry carefully; then heat the case to 200° or 210° Fahrenheit. Now pour the Metal in the Gate. If the Gate and the Vent are large enough, and the Case properly dried, the piece when finished will be as good as new.

A plain or single Gum Tooth may be attached when broken off, or added anew, by investing as for Gold or Silver; dry out and heat the piece; moisten the parts to be united with Muriate Zinc; use Blow-Pipe or Soldering Iron. (Solder with the same Metal.) The Metal melts at 440° Fahrenheit."

South Carolina State Dental Association.—We are pleased to learn that this Association was organized in Columbus S. C. on the 10th of November last, by the election of Dr. W. C. Wardlaw, of Abbeville, as President. Drs. W. B. McKellar, Newberry, and D. L. Boozer, of Columbia, as Vice Presdents, Dr. T. T. Moorse, of Columbia, Corresponding Secretary, and Dr. G. F. S. Wright, of Pomaria, Rec. Sec. and Treasurer.

Dr. Wm. Reynolds was elected to represent the Society at the meeting of the Southern Dental Association to be held in New Orleans in April.

The next meeting of this new Association will be held at Columbia May 3d 1870.

RULES AND REGULATIONS OF THE LIBRARY

The Library shall be open daily, except Sundays and holidays, from 9 A.M. till 1 P.M., and 2 till 5 P.M., Saturdays from 9 A.M. to 12 M., evenings from 7 to 10, except Saturdays, Sundays, and holidays.

The library is one of reference and *students* of the University have access to books and periodicals in the library room only.

Books may be taken out by officers of the School, at any time when the Library is open, unless otherwise ordered by the Librarian.

Application blanks will be provided on which must be written the full name and address of the borrower, the section or shelf number or letters, the number and title of the volume desired, and the date of application; and no book will be delivered except on presentation of such a blank properly filled out.

Only one volume at a time may be taken out, except at the discretion of the Librarian.

No volume may be retained for a longer time than is specified upon its cover, or, if no time is specified, for one week.

All books must be used and handled with care. The borrower is forbidden to write or mark in books or turn down the corners of the leaves, or to tear, or in any way to injure or deface them; and any damage to, or loss of, books shall be made good to the satisfaction of the Librarian.

No books marked with one star (*) will be lent for home use except by special permission of the Librarian. No book marked with two stars (**) may in any case be taken from the Library Building. No book marked with three stars (***) may be taken from the Library Building except by the written permission of the Librarian.

All books and pamphlets must be returned to the Library on receipt of notice from the Librarian requesting their return, and a fine of twenty-five cents will be imposed for each volume not returned promptly at the time requested.

Infraction of the above rules will subject the delinquent to a suspension of his privilege, or to such other penalty as the nature of the case may require.